

DOE Manual 413.3-1

Training Program

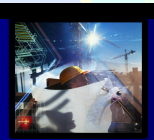
Introduction to Training

The following phase modules review material important to the planning and acquisition of capital assets.

- Each module has an Objectives listing and a Summary. These are designed to highlight key aspects to effectively propose, plan, manage, and tailor projects for DOE.
- This refresher training ends with a set of questions for further review of key concepts and principles.
- The intention of this training process is two-fold. First, to help Federal officials develop an understanding of the requirements detailed in DOE Manual 413.3-1, and secondly, to enable them to tailor their approach to meet these requirements—consistent with the complexity, visibility, cost, safety, and risk of the project.

Introduction

- Purpose of Manual
- Role of Manual
- Project Director
- Tailoring
- Contractor Systems

Purpose of Manual

Provides Requirements and Guidance for Planning and Acquisition of DOE Capital Assets

- Mandatory for All Projects over $5 Million

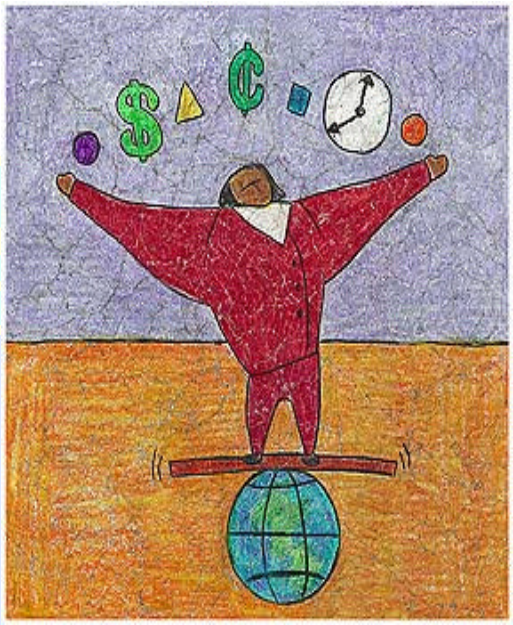
Role of the Manual

Improve Implementation of DOE Order 413.3

- No Additional Requirements
- Provide Building Blocks for Improved Projects and General Management

Project Director

- Roles
  - Investor - Developer
  - Strategist - Contract Manager
- Responsibilities
  - Planning - Budgeting
  - Programming - Project Services
- Trained and Certified



Roles and Responsibilities

Project Director

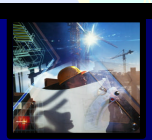
Project Director	Contractor Project Manager
• Responsible and Accountable for Success of the Project	• Responsible and Accountable for Contractor's Project Scope
• Leads the Integrated Project Team	• Key Member of the Integrated Project Team • Leads Integrated Project Team
• Tailors Requirements	• Supports Federal Project Director in Implementing Tailored Requirements
• Ensures Completion and Quality of Required Documentation and Deliverables	• Provides Input on Documents and Develops and Maintains Contractor Documentation • Delivers Deliverables as Defined in the Contract, On Time and Within Budget
• Proactively Identifies and Ensures Resolution of Critical Issues—Strives to Remove Any Barriers to Success • Integrates and Manages Government Reviews, Approvals, Property, Services, and Information	• Identifies and Ensures Timely Resolution of Critical Issues. Strives to Remove Any Barriers to Success
• Assesses and Reports Performance to DOE Management	• Communicates Accurate and Reliable Project Status and Performance Issues
• Monitors Contractor's Risk Management Efforts	• Identifies and Manages Project Risks
• Manages DOE Contingency Funds	• Manages Contractor's Management Reserve Funds

*The table is not intended to be a comprehensive listing of all roles and responsibilities nor is it meant to impart a contractual obligation on DOE Contractors

Exercise

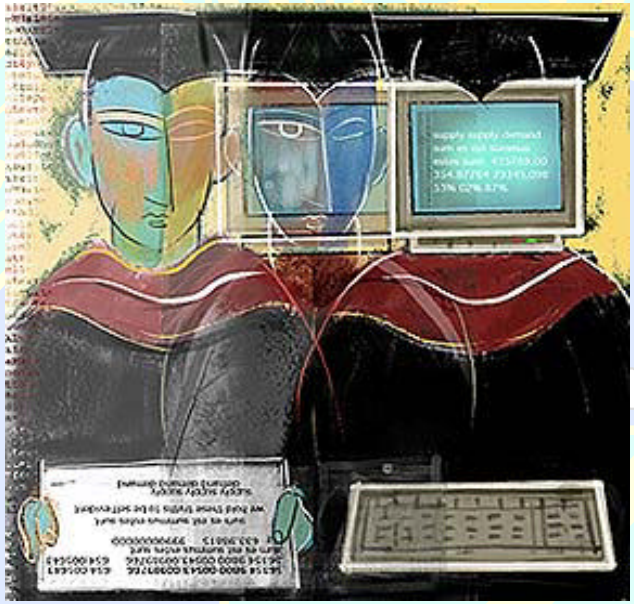
Discussion:

Project Director vs. Project Manager

Tailoring

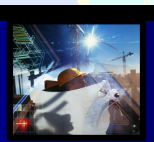
- Project Directors are Accountable
- Essential to Acquisition Process
- Consider Complexity, Cost, and Risks
- May Involve
  - Consolidation of Decisions
  - Documentation
  - Concurrency of Processes
  - “Bundling” Similar Projects
  - Adjusting Scope of Independent Project Reviews/External Independent Review

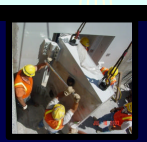


Does Not
Imply Omission

Exercise

Conduct a Discussion on Tailoring

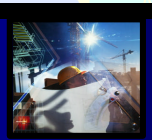


Contractor Systems

- Utilize
- Tailor
- Meet Intent of DOE Requirements

System Overview

- Management Process
- Program/Project Relationship
- Authorities
- DOE Acquisition Management Systems
- Performance Baseline
- Performance Measurement Baseline
- Performance Measurement Baseline Management

System Overview Objectives

- Review material from DOE Manual 413.3-1 and Practices necessary for the planning and acquisition of capital assets.
- While the following modules detail four phases (Initiation, Definition, Execution, and Initiation/Closeout), the Project Management system is actually made up of the processes that flow through these phases. It is these processes that enable the development of a cost-effective plan for the acquisition of capital assets

Management Process

Verified Needs/ Technology Opportunities

Sustainable Facilities/Systems

Meeting Required Mission!

Program/Project Relationship

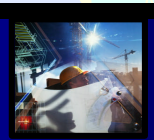
Program = Interdependent Mission Elements

Operational Activities
(Multi-year)

Projects
(Defined Beginning and Ending)

Major Systems > $400M
Other Projects < $400M

DOE Order 413.3 and DOE Manual 413.3-1 is Specific to Projects Over $5 Million

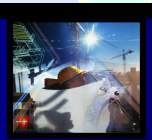



Authorities

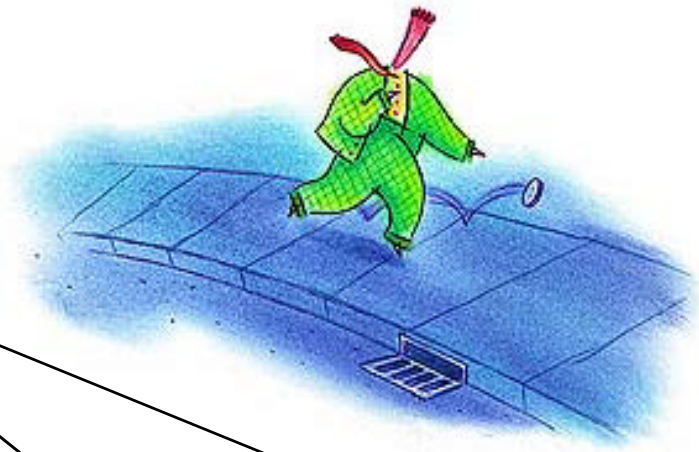
Critical Decision Authority	Total Project Cost	
Secretarial Acquisition Executive	**> $400M or < $400M when designated by SAE**	
Under Secretary/ NNSA Administrator (Acquisition Executive)	**< $400M**	**Acquisition Executive Delegation Allowed***
		To Program Secretarial Officers or Deputy Administrators/Associate Administrators for NNSA
Program Secretarial Officers or Deputy Administrators for NNSA	**< $100M**	To a Program Manager or field organization manager
	< $20M	To a direct reporting subordinate of the field organization manager

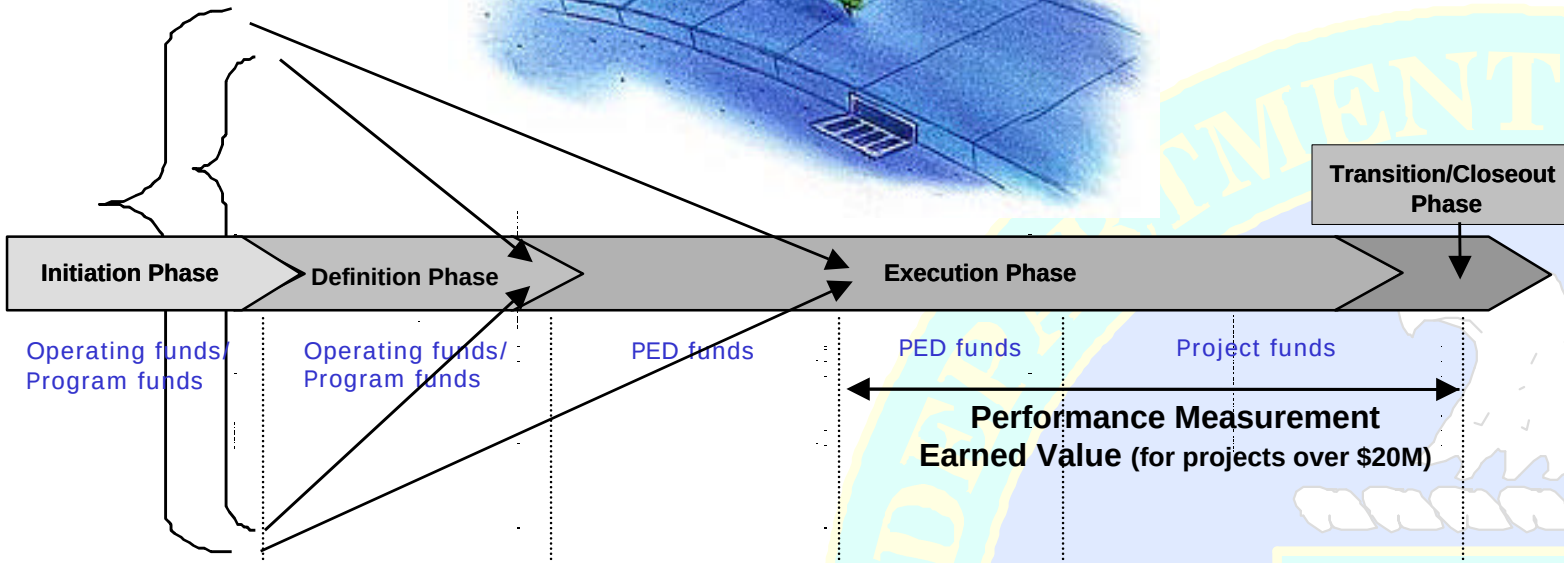
*Critical Decision -0, Approve Mission Need, may not be delegated below Program Secretarial Officer or NNSA Deputy Administrator level. The Under Secretary/Administrator NNSA and the Deputy Secretary must be formally notified of all CD-0, Approve Mission Need, and CD-4, Approve Start of Operations or Project Closeout, decisions for non-major system projects $100M and over.

- Requirements Applicable to All Projects over $5M
- Roles, Responsibilities, Authorities, and Approval Thresholds Shall be Complied with and Delegated Only as Provided (in Manual)

DOE Acquisition Management System





Critical Decisions

CD-0 Approve Mission Need

CD-1 Approve Alternative Selection and Cost Range

CD-2 Approve Performance Baseline

CD-3 Approve Start of Construction

CD-4 Approve Start of Operations or Project Closeout

Acquisition Executives

DOE Acquisition Management System

Delegated Commensurate with Size and Complexity

Roles and Responsibilities

- Approve Critical Decisions
- Approve Key Documentation
- Appoint and Chair Acquisition Advisory Board
- Approves Project Director
- Monitors Project Directors and Support Staff
- Approve Changes in Accordance with Thresholds
- Conduct Monthly and Quarterly Performance Reviews

Critical Decision Process

DOE Acquisition Management System

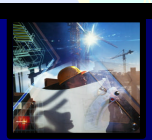
Critical Decisions

Identify Exit Points from One Phase and Entry to Succeeding Phase

Need → CD-0 → CD-1 → CD-2 → CD-3 → CD-4

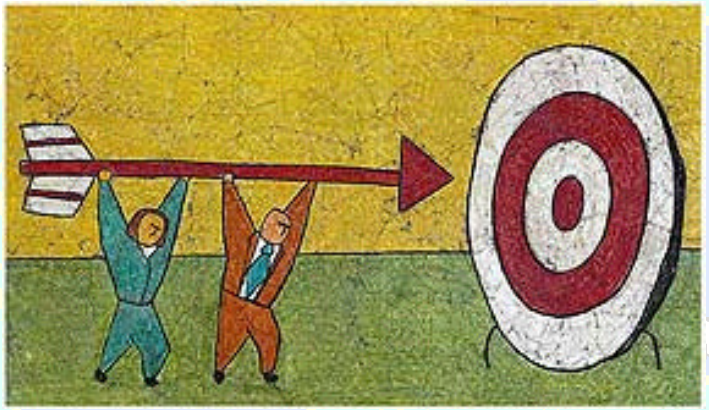
CD-0	CD-1	CD-2	CD-3	CD-4
Does the Department have a Mission Requirement that can't be Met through Non-Material Means?	Is the Selected Alternative the Right Solution?	Have Definitive Cost, Scope, and Schedule Baselines been Developed?	Is this Project Ready for Implementation?	Is the Project Ready for Turnover or Transition to Operations?

Increasing Commitment of Resources

Performance Baseline

- Established at Critical Decision-2
- Defines Cost, Schedule, Performance and Scope Commitment to which the Department will Execute the Project
  - Key Performance Parameters
  - Scope Parameters
  - Schedule Parameters
  - Risk Assessment
  - Mitigation Strategies
  - Performance Measurement System
  - Project Interface
  - Project Execution Plan
  - OMBE Validation
  - Functioning Performance Management System



Performance Baseline References

- Title 10, USC
  - The baseline shall include sufficient parameters to describe the cost estimate, schedule, performance, supportability…
- Supplement to OMB Circular A-11 Part 3, Planning Budgeting and Acquisition of Capital Assets
  - …baseline cost and schedule goals should be realistic projections of total cost, total time to complete the project, and interim cost and schedule goals
  - …performance goals should be realistic assessments of what the acquisition is intended to accomplish, expressed in quantitative terms if possible.

Definition

Performance Baseline

Key Cost, Schedule, and Performance Parameters that if cannot be met Requires Re-evaluation of the Concept, Alternatives, Strategy, and Plan

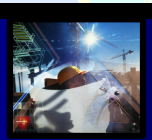
- Cost Parameters Identify Total Cost to Acquire Capability
- Schedule Parameters Identify Key Milestones, Decision Points, and Deliverables
- Key Performance Parameters are Expressed in Terms of Capability, Capacity, Quantities, or Performance Necessary to Meet a Mission Need

Cost Performance Baseline

Performance Baseline

TEC (Capital Estimate)	+	OPC (Operating Estimate)	+	Risk-Based Contingencies	+ Escalation =	Cost Performance Baseline

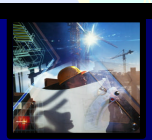
Includes All Costs Necessary for Completion Including Startup and "Hot" Testing

Spallation Neutron Source Example

Performance Baseline

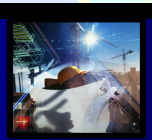
- Key Performance Parameter
  - Accelerator-based neutron scattering facility providing greater than or equal to 1 megawatt proton beam power on target
- Cost Parameter
  - Total Project Cost - $1,411.7 M
- Schedule Parameter (not all inclusive)
  - Baseline approval 12/97
  - EIS Record of Decision 6/99
  - Acceptances/Completion 6/06

Exercise

Performance Baseline

Develop Key Performance Parameters For Sample Project

How the Performance Baseline is Defined

Performance Baseline

Key Performance Parameters defined during Requirements Analysis & Concept Exploration

Total Project Costs & Major Milestone Schedules Established during Alternative Selection and Preliminary Design

PB Documented in Project Data Sheet and Approved by the AE Prior to the Budget Submission

DOE Commits to PB in Budget Formulation Process

PB is Accepted by OMB and Congress in the Budget Submission Appropriation Process

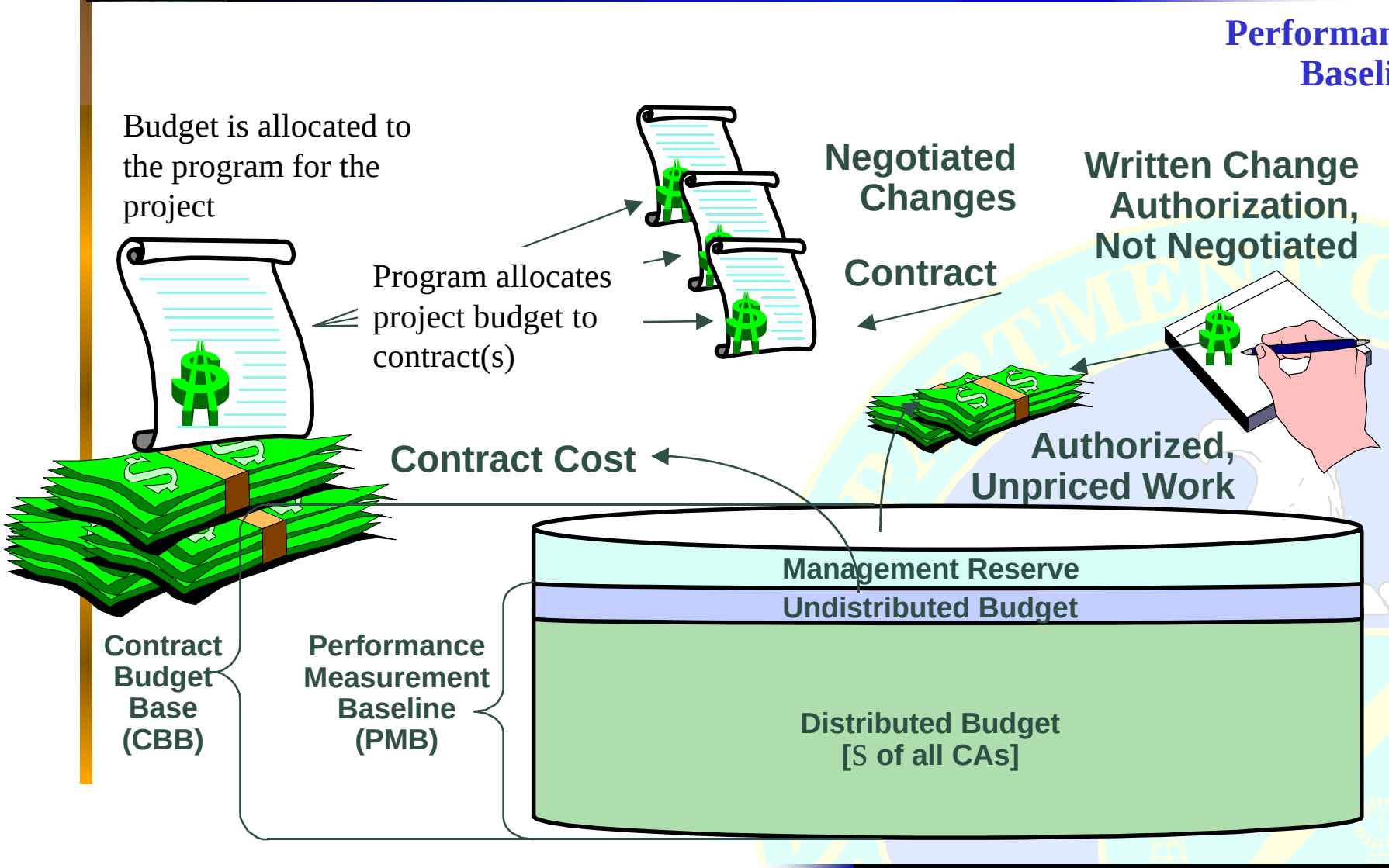
DOE Moves to Execution Phase

Mission Need Process Documents the Fundamental Need

Who Controls the Performance Baseline?

- PB is a Department Commitment to OMB, the Administration (President) and Congress (and by inference – the American People)
- PB is Controlled by the Those Who Have the Authority (and responsibility) to Make those Commitments
- The Department has Designated the Acquisition Executive (AE) as the Owner of the PB, which is Approved at Critical Decision-2

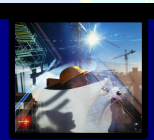
Contract Budget Structure



Allocating The Budget

Performance Baseline

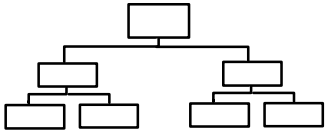
- Once Appropriated, the Programs and the Field Execute the PB through the Acquisition System Management and Procurement Management Processes
- Responsibilities are Assigned and Delegated Based Upon Cost and Criticality Factors for each Project
- Budgets are Assigned to Each Acquisition Effort when there are Multiple Government Awarded Contracts

Performance Measurement Baseline

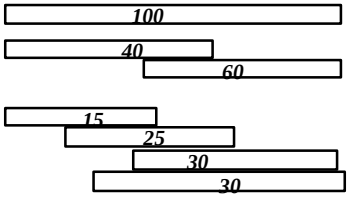
Establishing the Performance Measurement Baseline is an Iterative Process

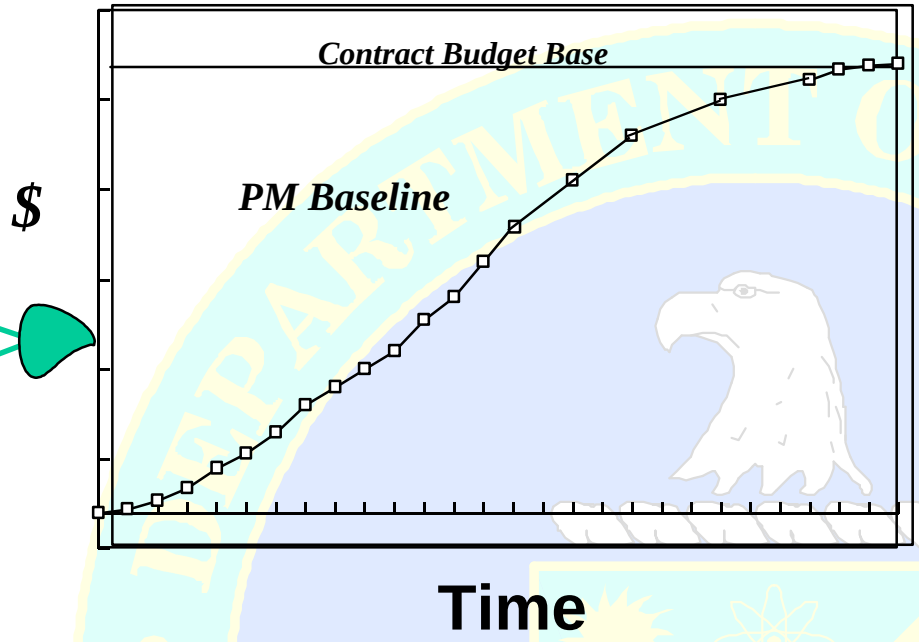
1. Define the Work



2. Schedule the Work

3. Allocate Budgets

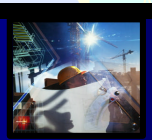




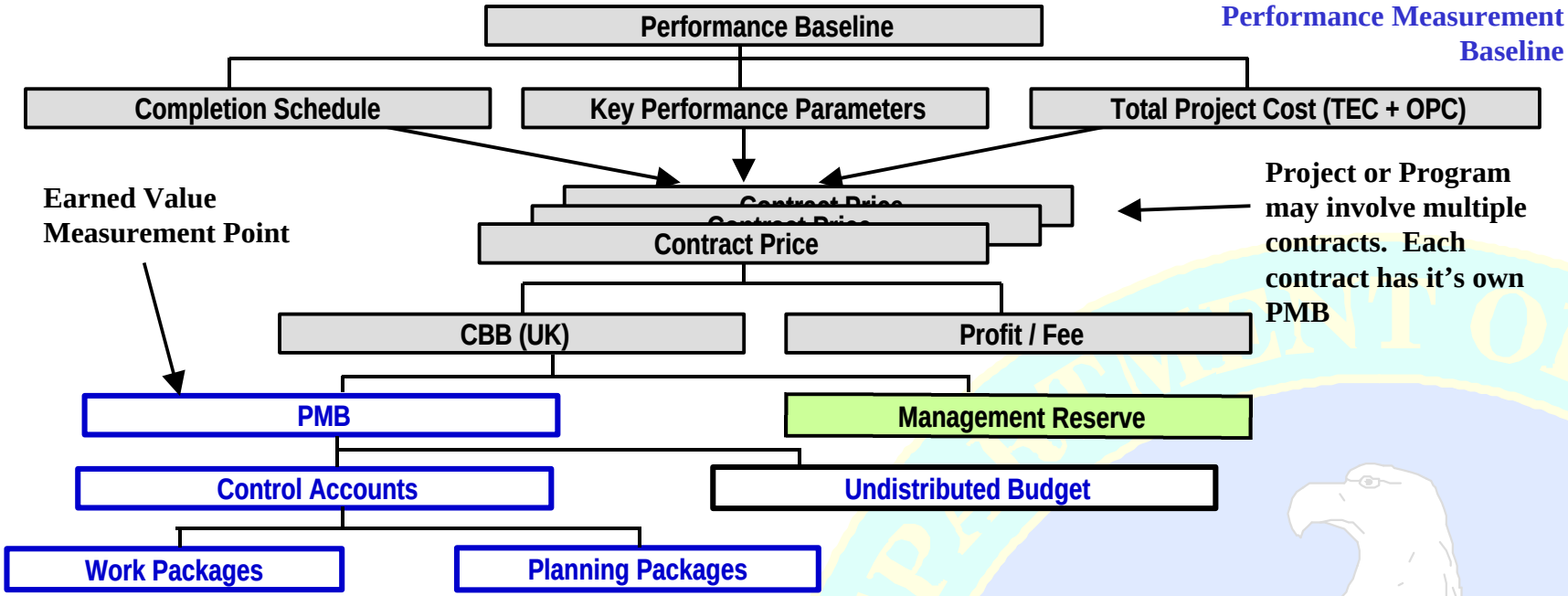
Creating a Time-Phase (budget) Baseline

Performance Measurement Baseline

- Budgets are Allocated to a Specific Contract or Contracts for Specific Scopes of Work
  - Each Contract has a Contract Budget Base (CBB)
- The Budgets within the CBB are Allocated to Work Packages, Planning Packages, and Level of Effort that is Scheduled to be Accomplished within a Given Time Period
- The Sum of the Work Packages, Planning Packages and Undistributed Budget is called the Performance Measurement Baseline (PMB)

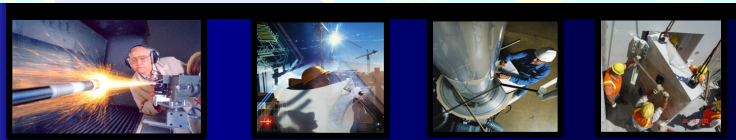



Performance Baseline

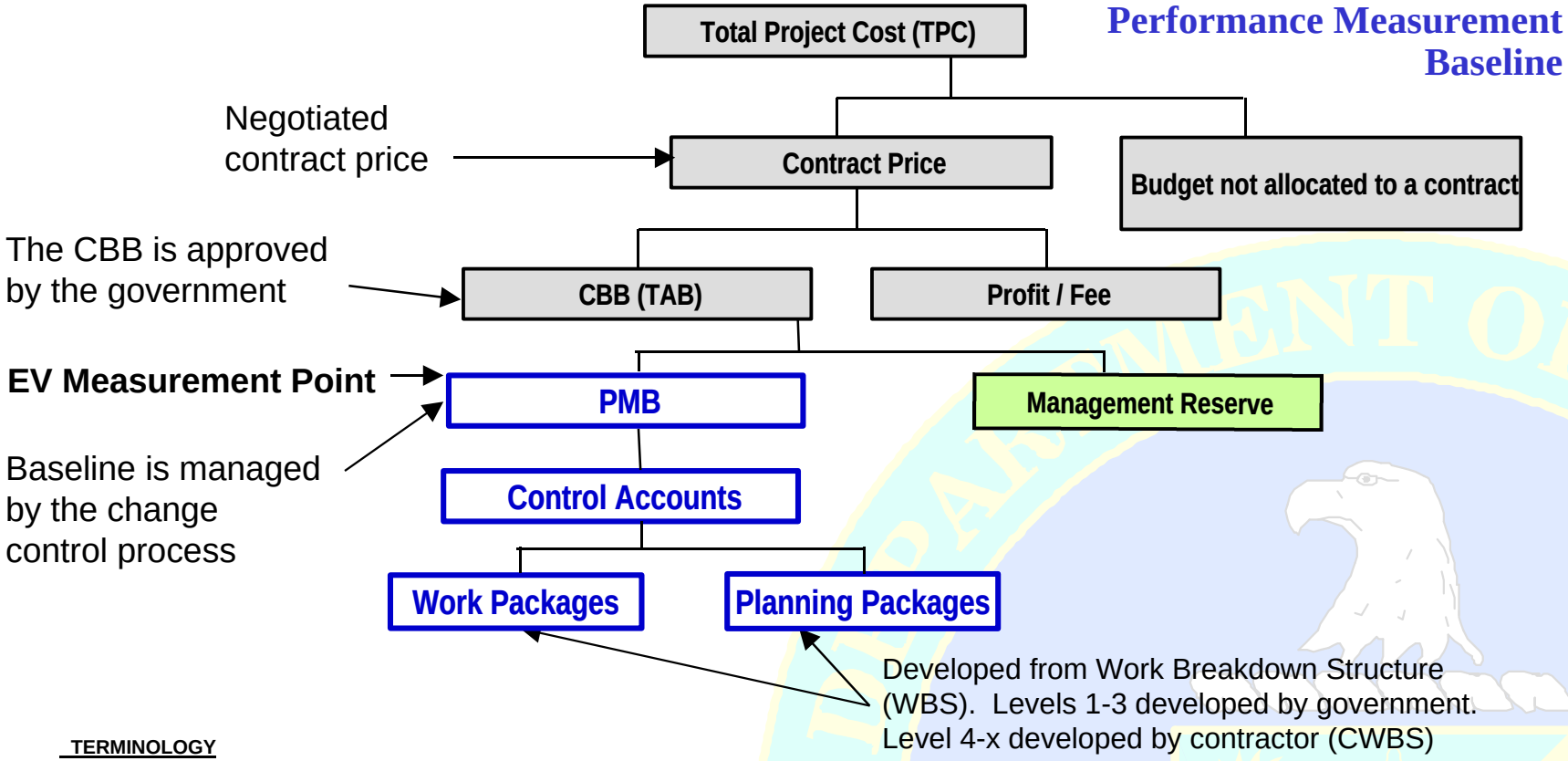


TERMINOLOGY

CBB	– Contract Budget Base	Sum of NCC and AUW
TPC	– Toal Projecgt Cost	Sum of all the budgets allocated for project, includes TEC & OPC
TAB	– Total Allocated Budget	Sum of all contract budgets - (includes MR)
BAC	– Budget At Completion	Cumulative BCWS - total end point of PMB (excludes MR)
PMB	– Performance Measurement Baseline	Contract time-phased, budgeted work plan (excludes MR)
MR	– Management Reserve	Reserve budget for unforeseen work
UB	– Undistributed Budget	Broadly defined activities not yet distributed to CAs
CA	– Control Account	Contractor key management control point - CWBS element
WP	– Work Package	Near-term, detail-planned activities within a CA
PP	– Planning Package	Far-term CA activities not yet defined into detail Work Packages
BCWS	– Budgeted Cost for Work Scheduled	Value of work scheduled -- PLAN
BCWP	– Budgeted Cost for Work Performed	Value of work completed -- EARNED VALUE
ACWP	– Actual Cost of Work Performed	Cost of work completed -- ACTUAL COSTS INCURRED
EAC	– Estimate At Completion	Estimate of total contract costs

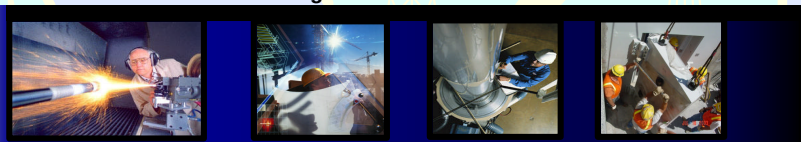


Budget and Performance Baseline Relationships



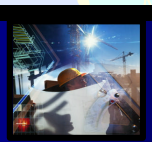
TERMINOLOGY

TPC	– Total Project Cost	The sum of all costs for a given project
NCC	– Negotiated Contract Cost	Contract Price less profit/fee (can equal CBB
CBB	– Contract Budget Base	Sum of NCC and AUW
TAB	– Total Allocated Budget	Sum of all contract budgets - (includes MR)
PMB	– Performance Measurement Baseline	Contract time-phased, budgeted work plan (excludes MR)
MR	– Management Reserve	Contractor PM's Contingency budget
CA	– Control Account	Contractor key management control point - CWBS element
WP	– Work Package	Near-term, detail-planned activities within a CA
PP	– Planning Package	Far-term CA activities not yet defined into detail Work Packages



Exercise

Develop a PMB using a PB

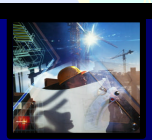
Performance Measurement Baseline Management

- The Project Budget Works for the Life of the Project
- The Project Budget is Allocated to Control Accounts within the Project
  - Control Accounts are Defined by the Integration of the Program Organization and the Work Breakdown Structure (WBS)
  - Control Accounts with Work Scope Comprise the Performance Measurement Baseline

Performance Measurement Baseline Management (cont.)

- Earned Value Management System
  - Relates Time-Phased Budgets to Tasks
  - Indicates Work Progress
  - Relates Cost, Schedule, and Technical Accomplishment
  - Provides Managers Information
- Key Parameters Objective Value ⟨Trade Space⟩ Threshold Value
  - Performance (Events)
  - Schedule (Milestones)
  - Cost (Contingency Utilization Curve)
  - Technical Scope (Quantity, Size, etc.)
- Develop Trade Space
  - Tradeoffs Must Not Compromise Threshold Values

Recovery Planning

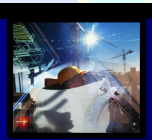



PMB Management and Change Control

- A Change in the Project/Baseline/WBS that Requires a Transfer out of Management Reserve (MR) is Allocated through the Change Control Process
- The Change Control Thresholds, as Defined in DOE Order 413.3, DOE Manual 413.3-1 and the Project Execution Plan (PEP) for each Project, Establish the Authority for Changes

Performance Measurement and Change Control

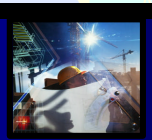
- Management Reserve (MR) is Allocated to the PMB through the Change Control Process
- The Change Control Thresholds, as Defined in DOE Order 413.3, DOE Manual 413.3-1 and the Project Execution Plan for each Project, Establish the Authority for Changes

Budget Execution and Project Management

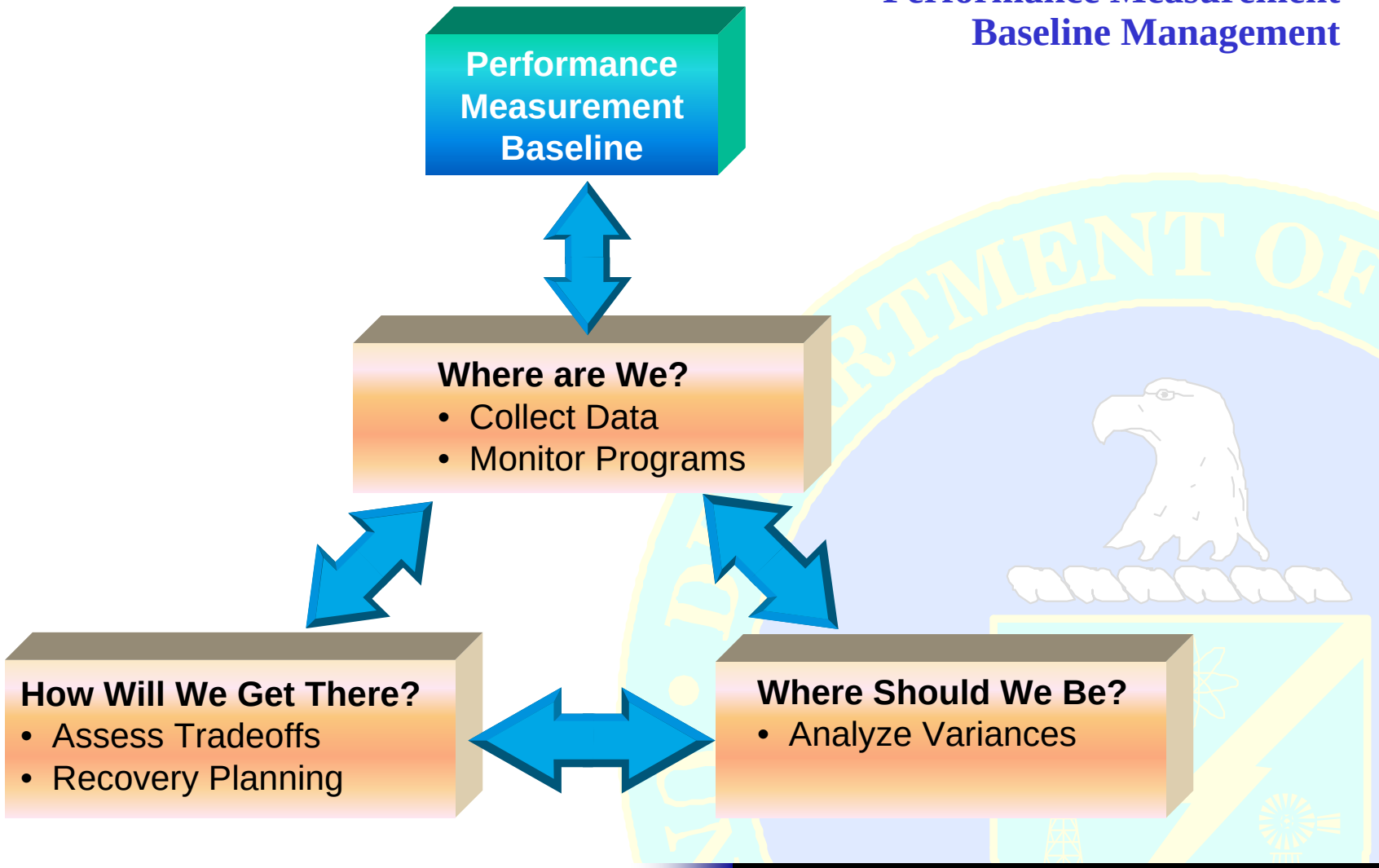
Performance Measurement
Baseline Management

- The Contractor May Not Allocate Entire Budget to Work Packages
  - May hold Budget at a Project Level (Management Reserve)
  - Budget not in PMB is Held in Separate Control Account (for which no work is allocated)
- Because PMB is a Tool that Provides Insight into the Project, it only Consists of Packages that Contain Actual Work Scope
  - Management Reserve is not part of the PMB until it is Allocated Against Work by Assigning to a Control Account with Work to be Accomplished
  - Management Reserve Accounting is Accomplished Identical to all other Control Accounts

Performance Measurement Baseline Analysis

Performance Measurement Baseline Management



Performance Baseline Deviation

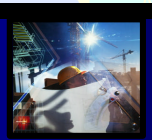
When Performance, Scope, Schedule, or Cost Parameters Cannot be Met

- Secretarial Acquisition Executive is to be Notified
- Approval Authority Decides to Terminate or Establish a New Performance Baseline

Performance Baseline Changes Requiring Approval by the Secretarial Acquisition Executive	
Major System and Non-Major System Projects	
Technical	Any change in scope and/or performance that affects mission need requirements or is not in conformance with current approved Project Data Sheet.
Schedule	6 month or greater increase (cumulative) in the original project completion date.
Cost	Increase in excess of $25M or 25% (cumulative) of the original cost baseline.

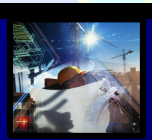
Initiation Phase

- Needs Emergence
- Integrated Project Team
- Mission Need Statement
- Needs/Program Requirements
- Functions vs. Performance Requirements
- Preliminary Risk Assessment
- Cost and Schedule Ranges
- Critical Decision-0 Package

Initiation Objectives

- Develop strategic plan identifying long-range goals
- Assess ability of current capabilities and capacities to meet goals
- Establish basis for mission need
- Identify performance gap between current and required capabilities and capacities
- Translate this gap into functional requirements
- Assess alternatives for funding and other needs
- Develop and approve Mission Need Statement
- Critical Decision-0, Approve Mission Need

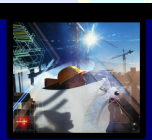
Needs Emergence

- Department Strategic Plan
- Congressional Direction
- Administration Issues
- Political Issues
- Legal Issues

User/Department Needs

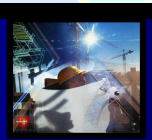
Mission Needs Statement

- Articulation
- Justification

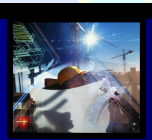
Integrated Project Team

- Professionals Representing Diverse Disciplines
- Specific Knowledge, Skills, and Abilities
- Led by Project Director
  - Team Charter and Operating Guide
  - Delegates Decision-making Authority
  - Requests and Allocates Budget
  - Maintains Environment that Rewards
  - Appoints Leads
  - Informs
  - Holds Regular Meetings
- Team Members
  - Support Project Director
  - Project Success

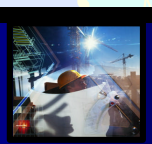
Mission Need Statement

- Documents Analytical Process to Evaluate and Define the Need
- Statement of Mission Need
  - Capability Shortfall or Gap
- Analysis to Support Mission Need
  - Quantify the Extent of Shortfall
- Importance of Mission Need and Impact if Not Approved
  - Priority Relative to Other Needs
  - Benefits
- Constraints and Assumptions
- Applicable Conditions and Interfaces
- Resource Requirements and Schedule
  - Key Milestones
  - Upper Bounds of the Cost Estimate
- Development Plan
  - Approach
  - Possible Alternatives

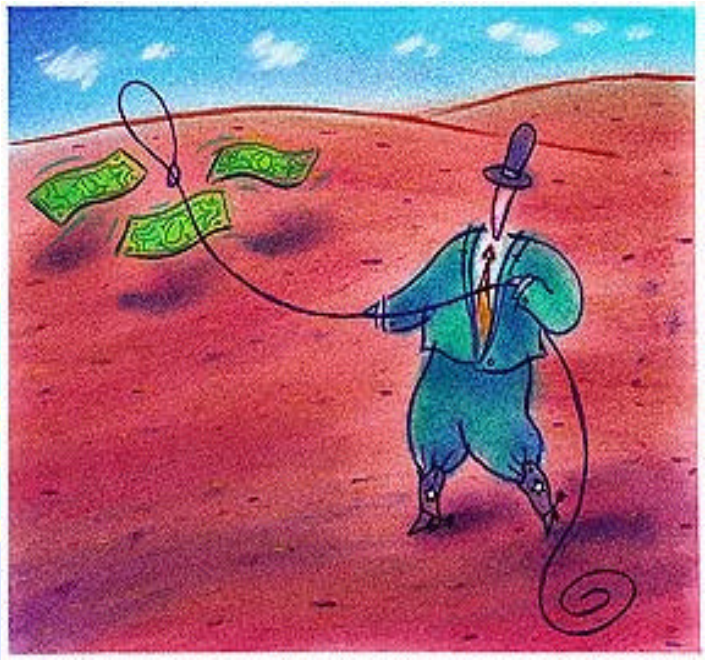
Exercise

Develop a Mission Need Statement

Needs/Program Requirements

- Needs Emergence
- Needs Recognition
- Needs Articulation
- Establishment of Functional/ Business Requirements
- Articulation of Technical Requirements

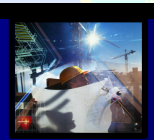


Note: Requirements Define What the Deliverable will Look Like and What it will Do. They Should be Testable.

Clearly Defined Need

Needs/Program Requirements

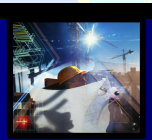
- Description
  - Written in Functional Terms (what): Key Performance Parameter
  - Not Based on Particular Design Solution
- Requirements (musts)
  - Include the Basis Statement and the Verification Method
- Goals and Objectives (desires/wants)
- Initial State
  - System Configuration/Conditions Prior to Task
- Final State
  - Desired Configuration, Products, and Performance

Clearly Defined Need (cont.)

Needs/Program Requirements

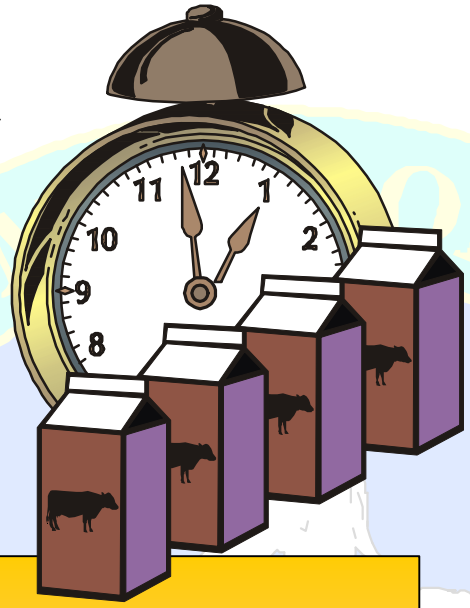
- Define Boundary
  - Extent of the "System"
  - External Interfaces (inputs and outputs)
- Key Concepts
  - Operational Characteristics
  - Decontamination and Decommissioning Characteristics
- Key Performance Parameters
  - Criteria for Determining Success

Functions versus Performance Requirements

Needs/Program Requirements

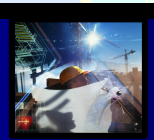
- *Functions* Present "What" the System Must Do
  - Make Chocolate Milk
- *Performance Requirements* Present "How Well" the Systems Must Work
  - The System Shall Blend 4 Gallons of Milk and 1 Cup Chocolate in 1 Hour
  - The System Shall Provide 12 Gallons of Chocolate Milk Per Day



Examples of Key Performance Parameters

– The Pit Assembly and Conversion Facility Shall be Capable of Processing 35 Metric Tons of Plutonium Metal Over 10 Years of Operation

– The Research Office Building Shall Be Capable of Housing 300 Scientists, Engineers, and Other Support Personnel

Requirements Analysis

Needs/Program Requirements

A Good Requirement is….

- *Necessary* (What is the Worst Thing that Could Happen if the Requirement was not Included?)
- *Verifiable* (What are the Criteria for Acceptance or How Will You Verify the Requirement?)
- *Attainable* (Is the Requirement Technically Feasible and Doe it Fit within Budget, Schedule, and Other Constraints?)
- *Clear* (Is the Requirement Simple and Concise?)

Impact of Poor Functions and Requirements

Fix Functions

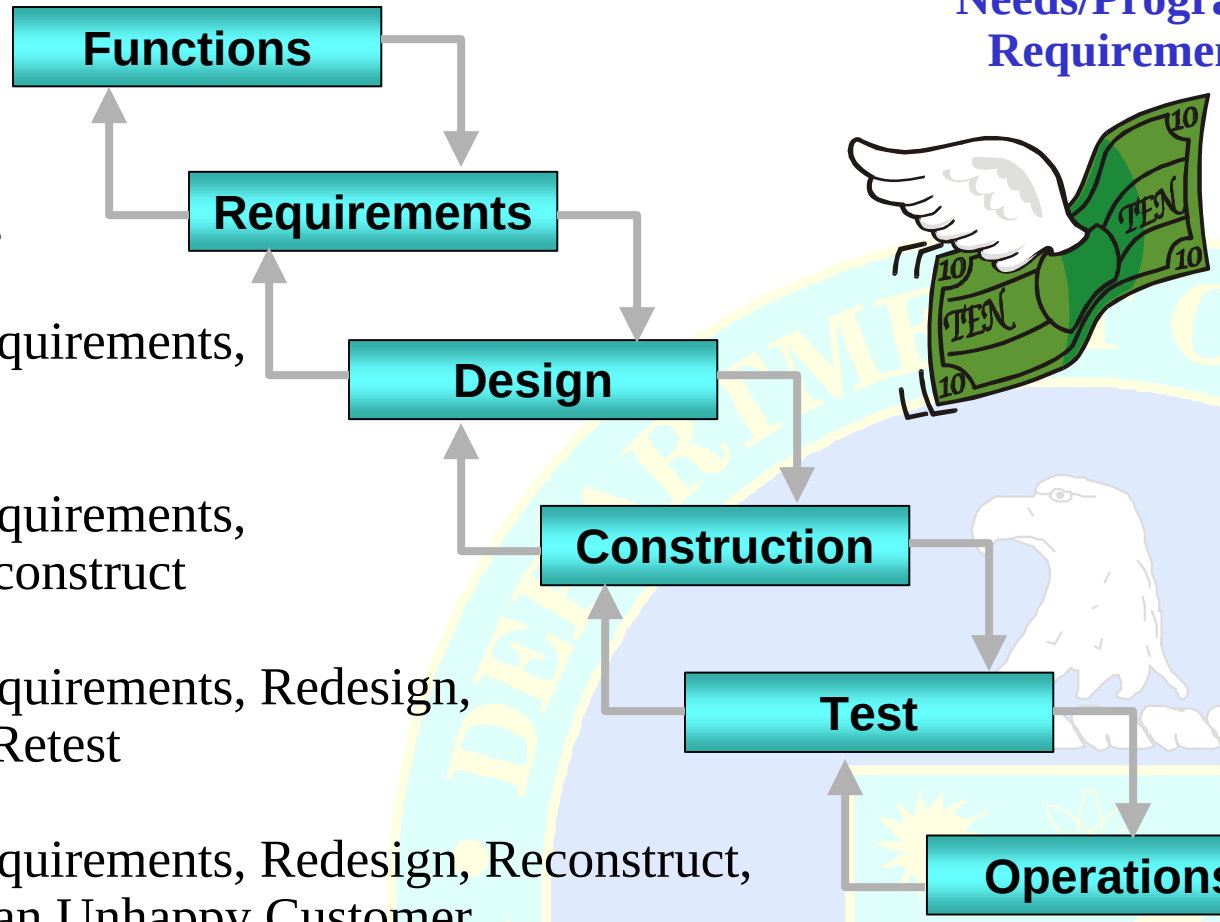
Fix Functions and Requirements

Fix Functions, Requirements, and Redesign

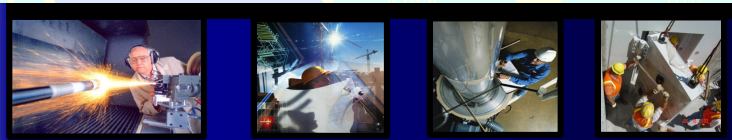
Fix Functions, Requirements, Redesign, and Reconstruct

Fix Functions, Requirements, Redesign, Reconstruct, and Retest

Fix Functions, Requirements, Redesign, Reconstruct, Retest, and Have an Unhappy Customer

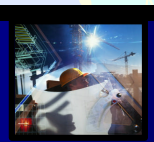


Needs/Program Requirements



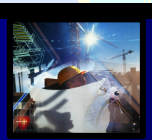
Exercise

Develop Functions and Requirements for Sample Project

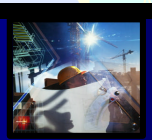
Preliminary Risk Assessment

- A Preliminary Risk Management Program Should
  - Be Feasible, Stable, and Provide Well-understood User Requirements
  - Foster a Close Relationship with User, Industry, and Other Appropriate Participants
  - Be Planned and Structured
  - Be Used to Develop a Preliminary Acquisition Strategy Based on Risk Level and Risk Handling Strategies
  - Develop Formal Documentation

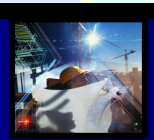
Guidelines

- Structured Process
- Utilize a Complete Integrated Project Team
- Assess Mission Need/Requirements
- Identify Critical Issues for Conceptual Design
- Utilize to Develop/Justify Schedule and Cost Contingencies

Exercise

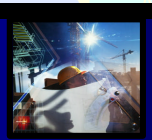
Perform a Preliminary Risk Assessment on Mission Need/ Requirements (Sample Project)

Cost and Schedule Ranges

Development

- Utilizes Viable Alternatives—that Meet the “Mission Need”
- Employs Top-Down Estimating
- Uses Risk Assessment to Develop/Justify Contingencies and Ranges

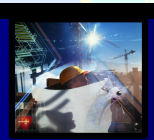
Estimating Cost Range

- Top-down Cost Estimating Avoids Detailed Cost Buildup. Estimates are Made on the Basis of Rough Statistical Relationships.
  - For Example, cost estimates on doing the finish work on building a clothing boutique in a shopping mall are typically derived according to the number of square feet of space that the store will occupy.
    (Cost = Sq. Ft. x $/Sq. Foot)
- Parametric Cost Estimating is a Common Approach to Top-down Estimating.

Exercise

Develop a Cost and Schedule Range for Sample Project

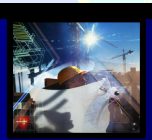
- Justify the Ranges using Preliminary Risk Assessment

Critical Decision-0 Package

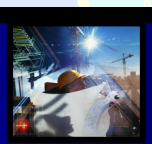
Deliverables

- Mission Need Statement
- Program Requirements Document
- Cost and Schedule Ranges

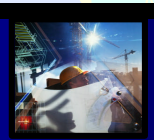
Initiation Summary

- TBD

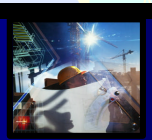
Definition Phase

- Integrated Project Team
- Selecting Alternative
- CD-1 Development Process
- Systems Engineering
- Work Breakdown Structure
- Performance Requirements
- Conceptual Design Report
- Risk Management
- Integrated Safety Management
- Quality Management
- Contracting and Contract Management
- Cost and Schedule Ranges
- Preliminary Project Execution Plan

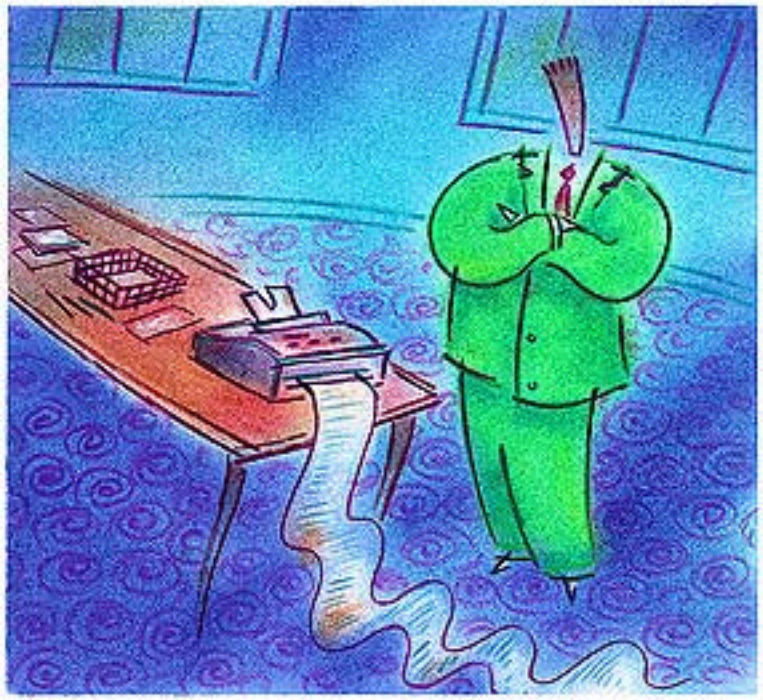
Definition Objectives

- Further define required capabilities, considering available technology, affordability, and value
- Begin activities to analyze and select appropriate alternatives
- Analyze and document requirements
- Develop Acquisition Strategy
- Develop Conceptual Design Report
- Conduct comprehensive risk analysis
- Present recommended alternatives to SAE or designated AE for review and approval
- Critical Decision-1 - Approve Alternative Selection and Cost Range

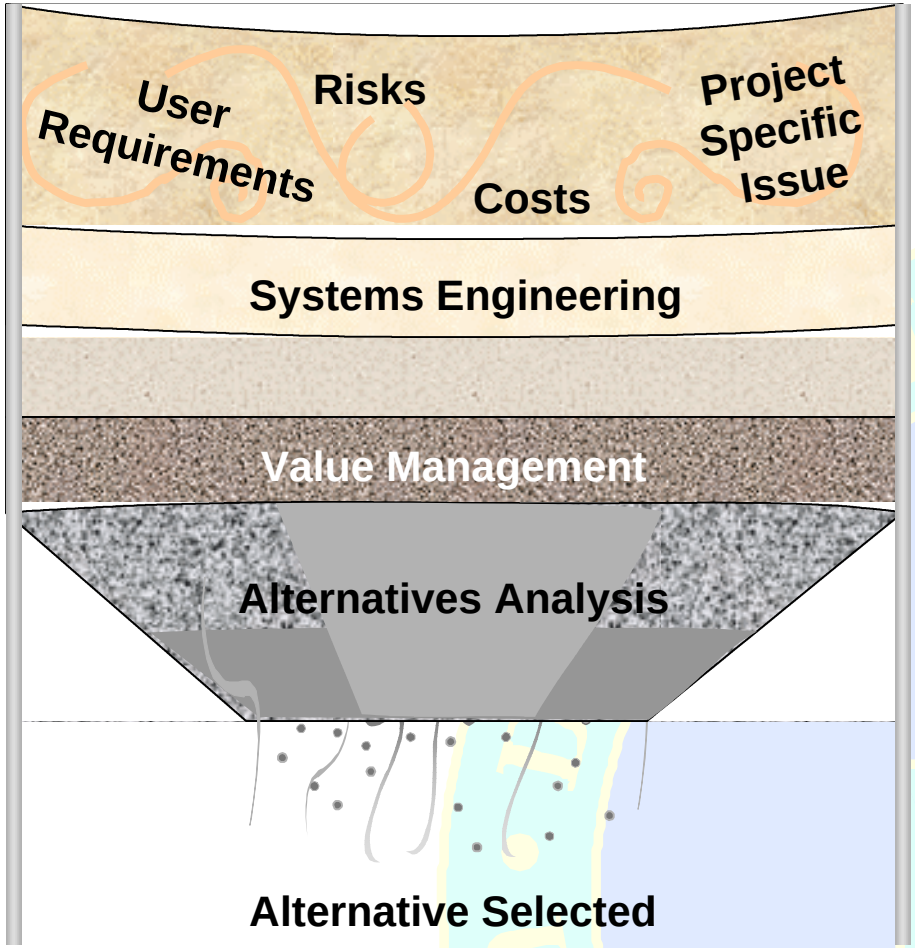



Integrated Project Team

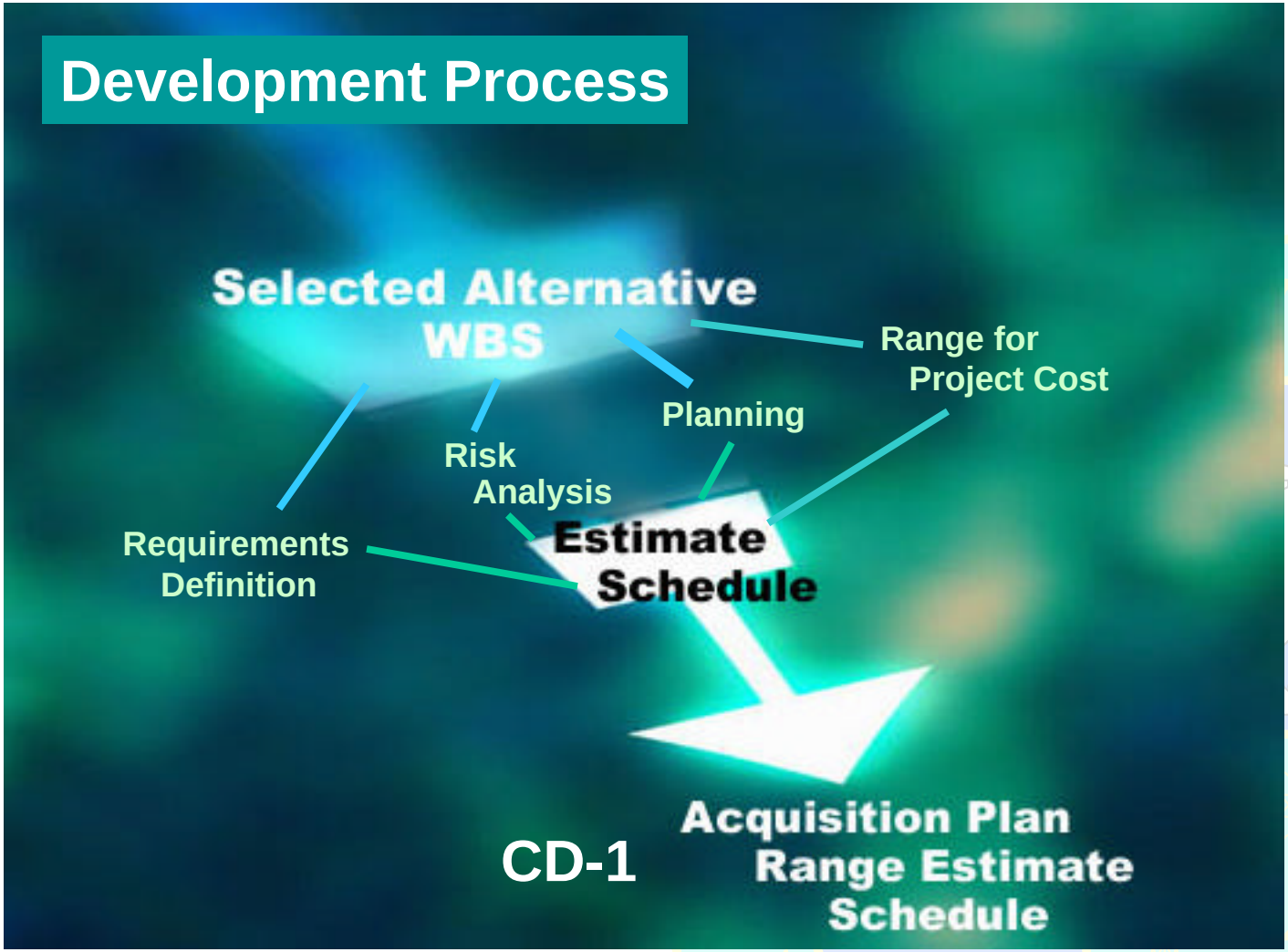
- Include Design Agency
- Integrate Users/Owners/Program
- Contractor Project Manager Establishes a Contractor Integrated Project Team (IPT)
- Project Director Establishes/Maintains an IPT Charter



Selecting Alternative



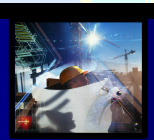
CD-1 Development Process



Systems Engineering

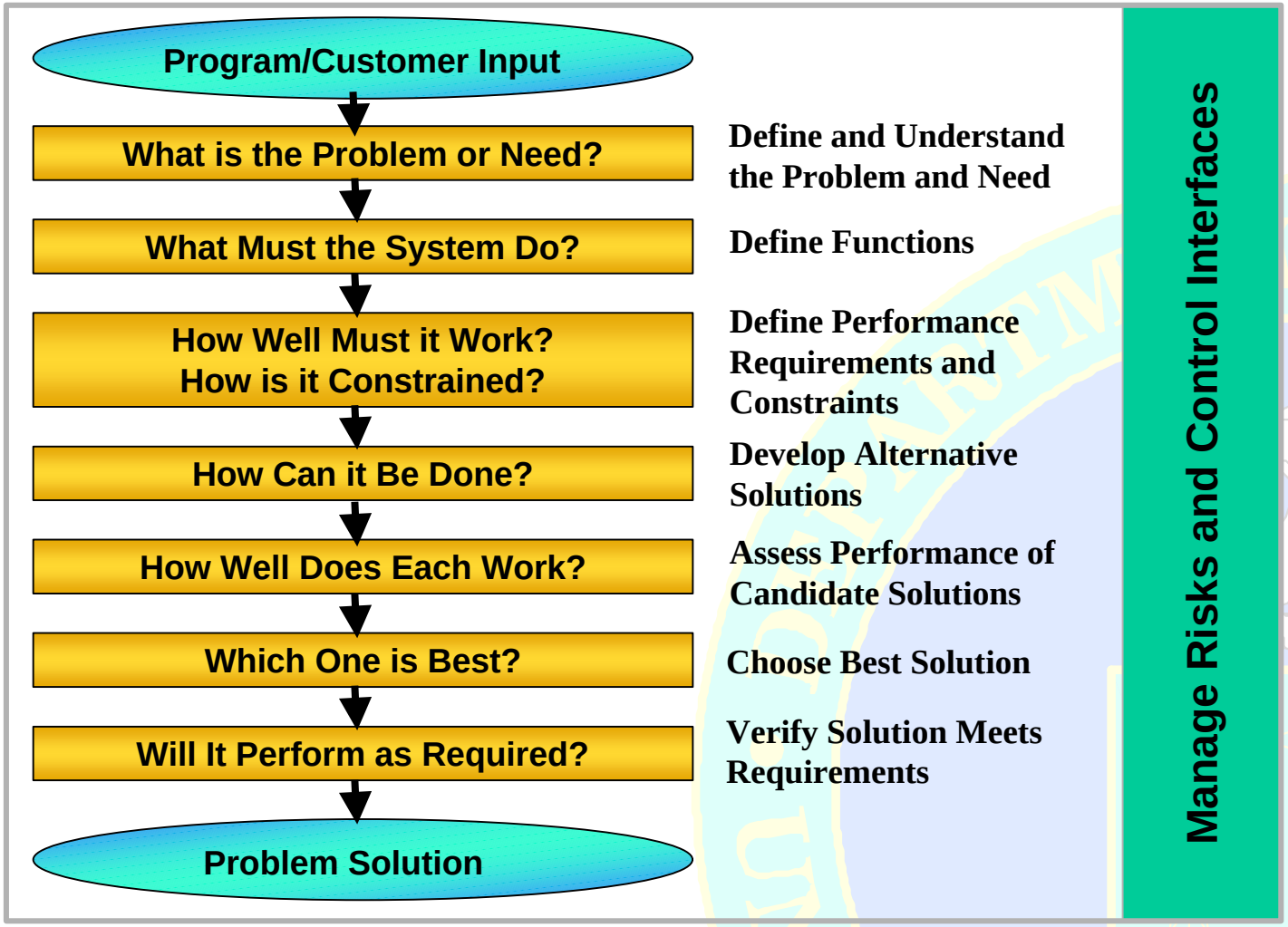
The systems engineering process can be viewed as a hierarchy beginning with the definition of a need, progressing through to a baseline and ending with verification that the need has been met. The principles of the hierarchy are:

- ***Need*** What is the Need for this Project?
- ***Functions*** What are the Functions to be Performed by this Project?
- ***Requirements*** What are the Performance Requirements and Constraints on the Project?
- ***Criteria*** What Criteria shall be Used to Select Among Alternatives for Performing the Functions and Meeting the Requirements?
- ***Alternatives*** What Alternative Solutions are Available to Perform the Functions and Meet the Requirements?
- ***Technical Baseline*** What is the Best or the Preferred Alternative for Performing the Functions and Meeting the Requirements?
- ***Verification*** What is the Proof that the Preferred Alternative Performs the Functions and Meets the Requirements?

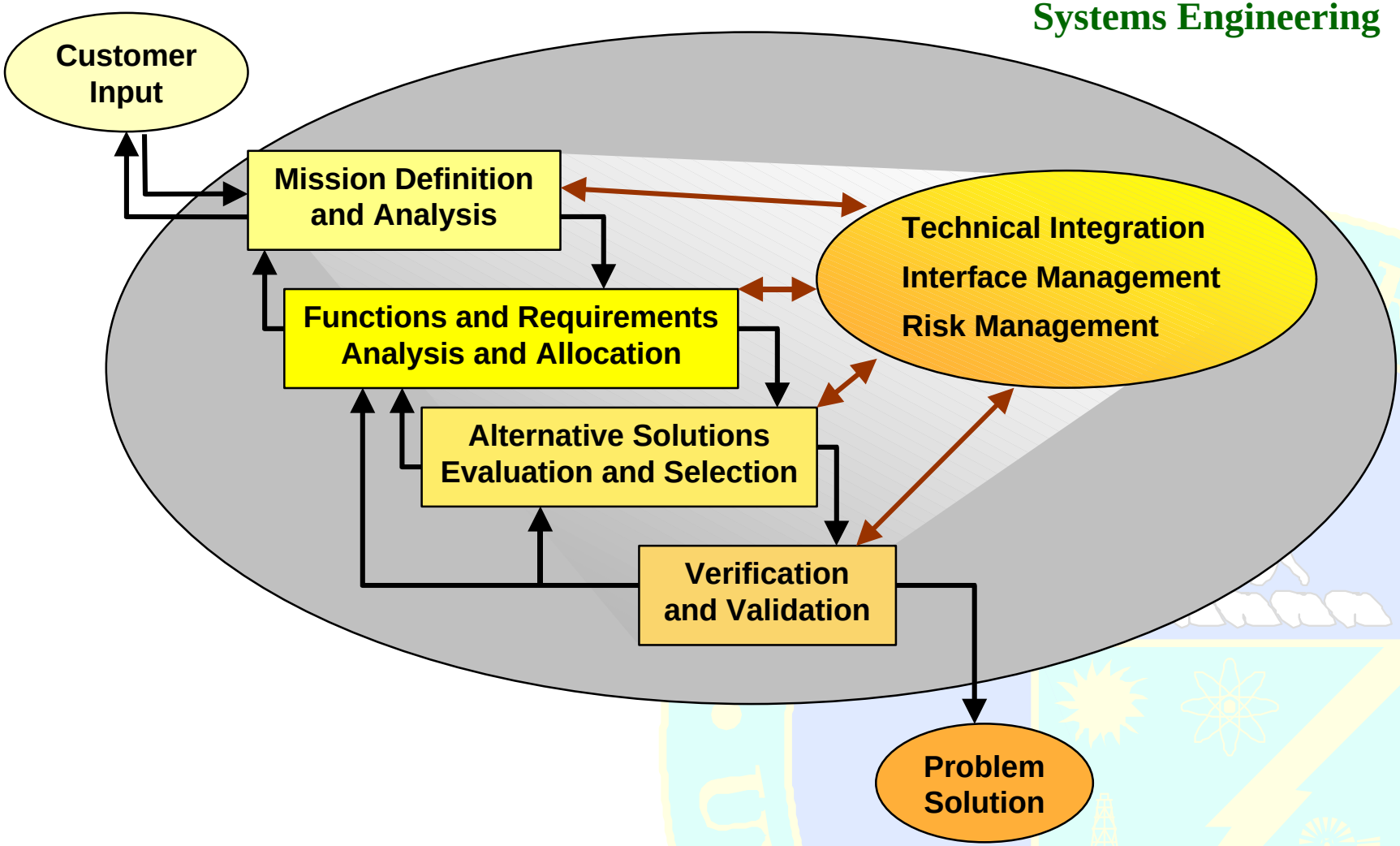



Approach to Project Definition

Systems Engineering



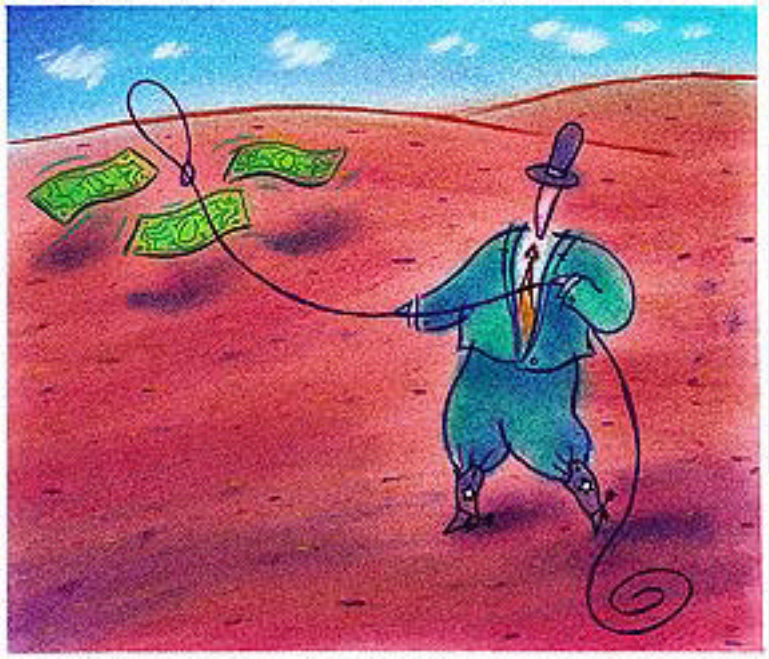
Systems Engineering Process



Alternative Studies

The Alternative Study Process

- Delineate the Deliverables or Function and Requirements that are Required
- Identify Alternatives that can Meet the Deliverables or Function and Requirements
- Evaluate and Select one of the Alternatives



General Factors in Prioritizing Alternatives

Effective Prioritization that Leads to Significant Project Selection Decisions takes into Account a Variety of Factors

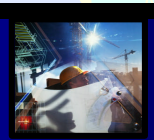
- Programmatic
- Technical
- Financial (Life Cycle Cost)
- Personnel
- Firm Reputation and "Political"
- Administrative and Miscellaneous
- Technology

Life Cycle Costs

- Serves Primary Purposes of
  - Alternative Analysis
  - Critical Decision Point to Assess System's Affordability
- Base Year Dollars Estimate. Includes Costs for:
  - Research and Development
  - Testing
  - Production
  - Facilities
  - Operations
  - Maintenance
  - Personnel
  - Environmental Compliance
  - Disposal

Life Cycle Cost (LCC) Estimates

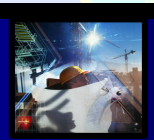
- The Project Director is Responsible for Including LCC Estimates and Selection of Alternatives in the Decision-making Process
- Includes the Following Costs
  - Acquisition
  - Research and Development
  - Operating
  - Maintenance
  - Decontamination and Decommissioning
- Includes Assumptions
- Tailored to Meet Need

Work Breakdown Structure

A Project Work Breakdown Structure (WBS) is a Deliverable or Product-oriented Grouping of Project Work Elements Shown in Graphical Display to Organize and Subdivide the Total Work Scope of a Project.

- A WBS is the cornerstone of effective project planning, execution, controlling, statusing, and reporting.
- All the work contained within the WBS is to be identified, estimated, scheduled, and budgeted.
- The WBS is the structure and code that integrates and relates all project work (scope, schedule, and cost).
- The WBS contains the project's scope baseline necessary to achieve the technical objectives of the work described.

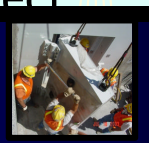



Work Breakdown Structure Elements

The WBS is a Multi-level Framework that Organizes and Graphically Displays Elements Representing Work to be Accomplished in Logical Relationships. The WBS Elements (work packages) are:

- Definable—can be described and easily understood by project participants.
- Manageable—a meaningful unit of work where specific responsibility and authority can be assigned to a responsible individual.
- Estimateable—duration can be estimated in time required to complete, and cost can be estimated in resources required to complete.
- Independent—minimum interface with or dependence on other ongoing elements (i.e., assignable to a single control account, and clearly distinguishable from other work packages).
- Integratable—integrates with other project work elements and with higher level cost estimates and schedules to include the entire project

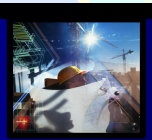


Product-Oriented Work Breakdown Structure

Work Breakdown Structure

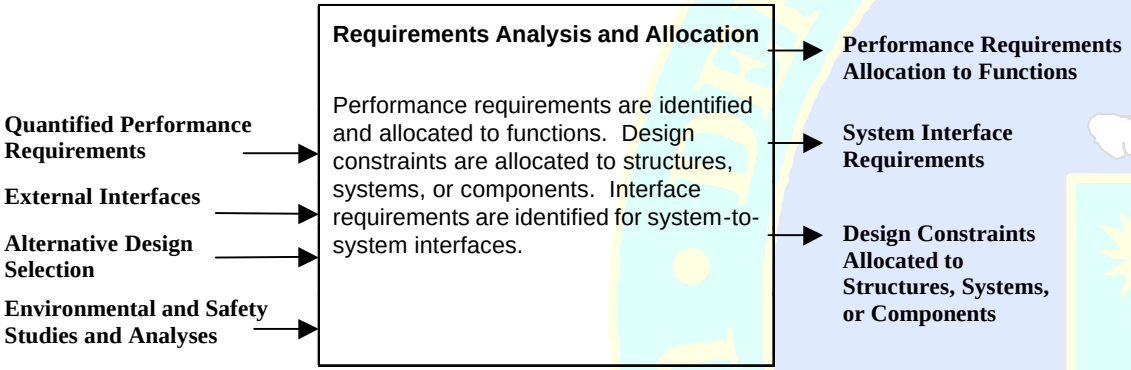
1.0.0.0.0 House
- 1.1.0.0.0 Foundation
  - 1.1.1.0.0 Excavation
    - 1.1.1.1.0 Survey
      - 1.1.1.1.1 Measurement
      - 1.1.1.1.2 Boundaries Staked Out
  - 1.1.2.0.0 Concrete Slab
    - 1.1.2.1.0 Acquisition of Materials
      - o
      - o
- 2.1.0.0.0 Framework
  - o
  - o

Performance Requirements

Identify Set of Performance Requirements, Design Constraints, and Interface Requirements for Each Function.

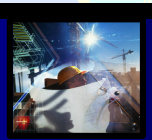
- Performance Requirements—How Well _____



Conceptual Design Report

Presents Results of Analysis of Requirements, Risks, and Alternatives to Arrive at a Recommended Solution. Common Elements of the Report Are:

- A description of the recommended alternative
- A schedule and cost range (or rough order of magnitude cost)
- An alternatives analysis including life cycle costs, operational considerations, site development considerations, relationships to other site activities, and the comparison of alternatives, the risks, and the determined preferred alternative.
- A preliminary Safeguards and Security Plan
- Performance parameters
- A preliminary Project Execution Plan
- The summary test and acceptance criteria
- The Work Breakdown Structure, which identifies the elements of the end product and dictionary

Conceptual Design Report (cont.)

Conceptual Design Report

- A waste minimization/pollution identification and prevention plan, and a Waste Management Plan
- Assessments of and strategy for:
  - The National Environmental Policy Act (NEPA)
  - Safety
  - Security Considerations
  - Site Selection
  - Waste Management.
- Public and/or stakeholder input
- Preliminary interface control documents
- System requirements and applicable codes and standards for design, procurement, construction, or characterization
- Anticipated/project products/deliverables (project end-state)
- Project Constraints
- Conceptual design drawings/renderings/calculations
- Readiness assessment or readiness review concepts
- A vulnerability assessment
- A preliminary plan for demobilization and/or disposal of facilities being replaced

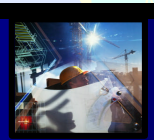
What is Risk Management?

The Risk Management Process

Risk Management is the Continuing Process of Planning, Quantifying, Handling, and Controlling Future Events that May have an Impact on Project Success

The Nature of Risk

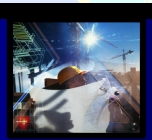
Risk is an Event that Might Happen to the Detriment of a Program, Project, or Activity

Sources of Risk

Typical Sources of Possible Risk Events

- Incomplete Mission/Requirements Definition
- Design Complexity
- New Technology or New Application
- Environmental/Regulatory
- Offsite Shipments/Receipts
- Funding Constraints/Interruption
- Numerous Assumptions
- Resource Limitations
- Integration/Interfaces

Exercise

Risk: There Could be a Serious Injury Accident in the Drive Across Town

Scenario 1
Probability: Unlikely – Driver Dad
Consequence: Crisis – 10 yr. old Car, 70 mph
Risk: High

Scenario 2
Probability: Unlikely – Driver Dad
Consequence: Critical – New Car with ABS & Airbags, 70 mph
Risk: Moderate

Scenario 3
Probability: Unlikely – Driver Dad
Consequence: Marginal – New Car & 30 mph
Risk: Low

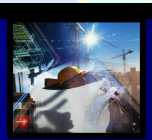
Scenario 4
Probability: Likely – Driver Teenage Son
Consequence: Crisis – 10 yr. old Car, 70 mph
Risk: High

Scenario 5
Probability: Likely – Driver Teenage Son
Consequence: Critical – New Car with ABS & Airbags, 70 mph
Risk: High

Scenario 6
Probability: Likely - Driver Teenage Son
Consequence: Marginal – New Car & 30 mph
Risk: Moderate

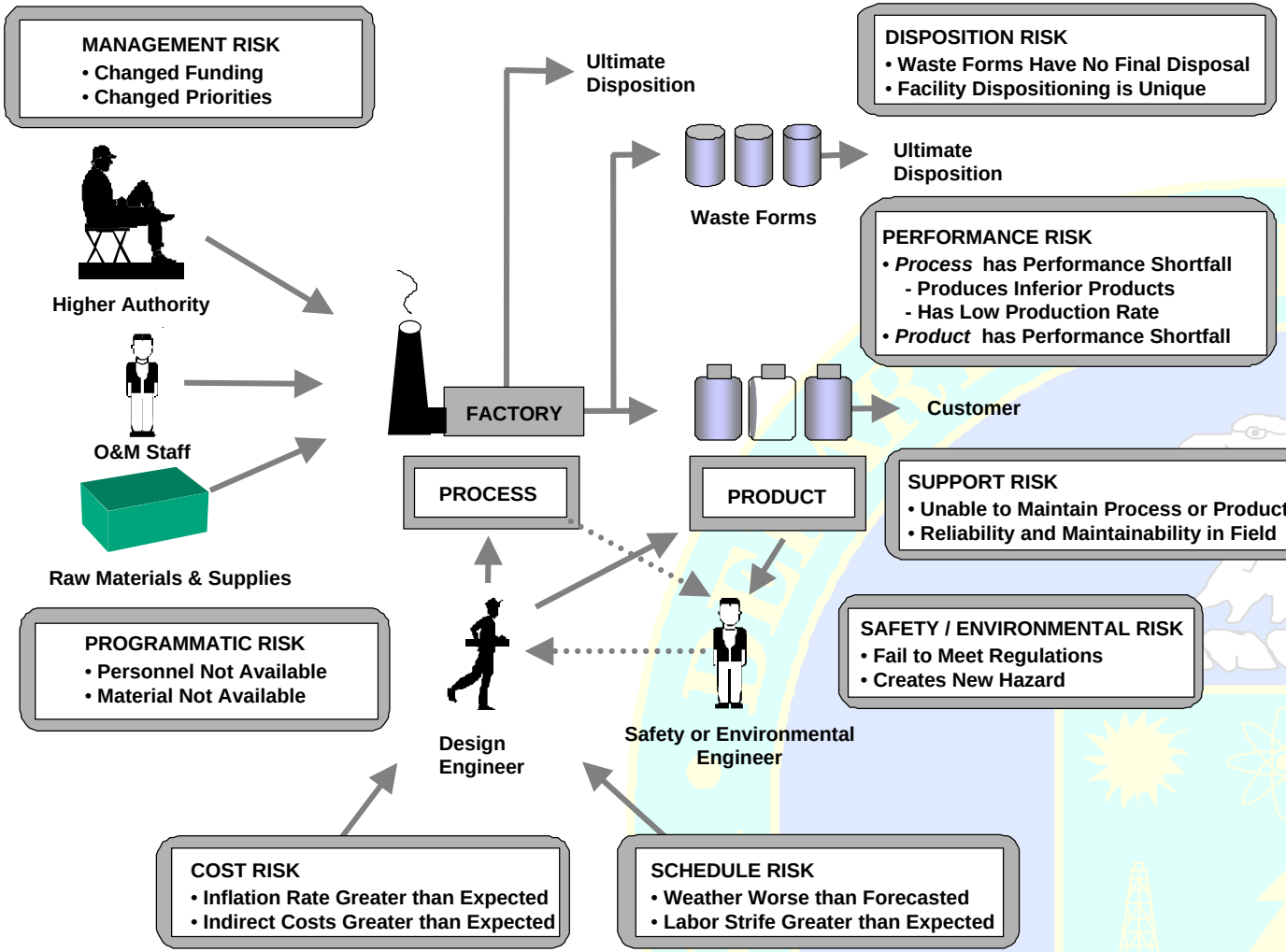
Types of Risk

- Business Risk
  Risks associated with investment decisions. Key components include financial risk and market risk. Both gains and losses
- Insurable Risk
  General category of risk of loss (e.g. Car accident. Schedule slippage)
- Programmatic Risk
  Possible disruptions caused by decisions, events, or actions that affect project direction, but are outside the manager's control
- Technical Risk
  Possible impacts associated with developing a new design/process (or approach) either to provide a greater level of performance or to accommodate some new requirements or constraints
- Political Risk
  Risk that an organization will lose control over its assets owing to the action or inactions of governments

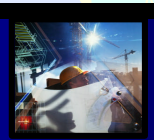
Types of Risk

Risk Management



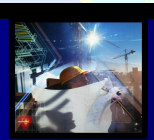
What is Risk Management?

- A Management Tool for Minimizing the Probability and/or Consequences of Adverse Events
- A Structured, Formal, and Disciplined Approach to Determine and Control Risks
- Includes Processes Concerned with Planning, Identifying, Analyzing and Responding to Potential Risks

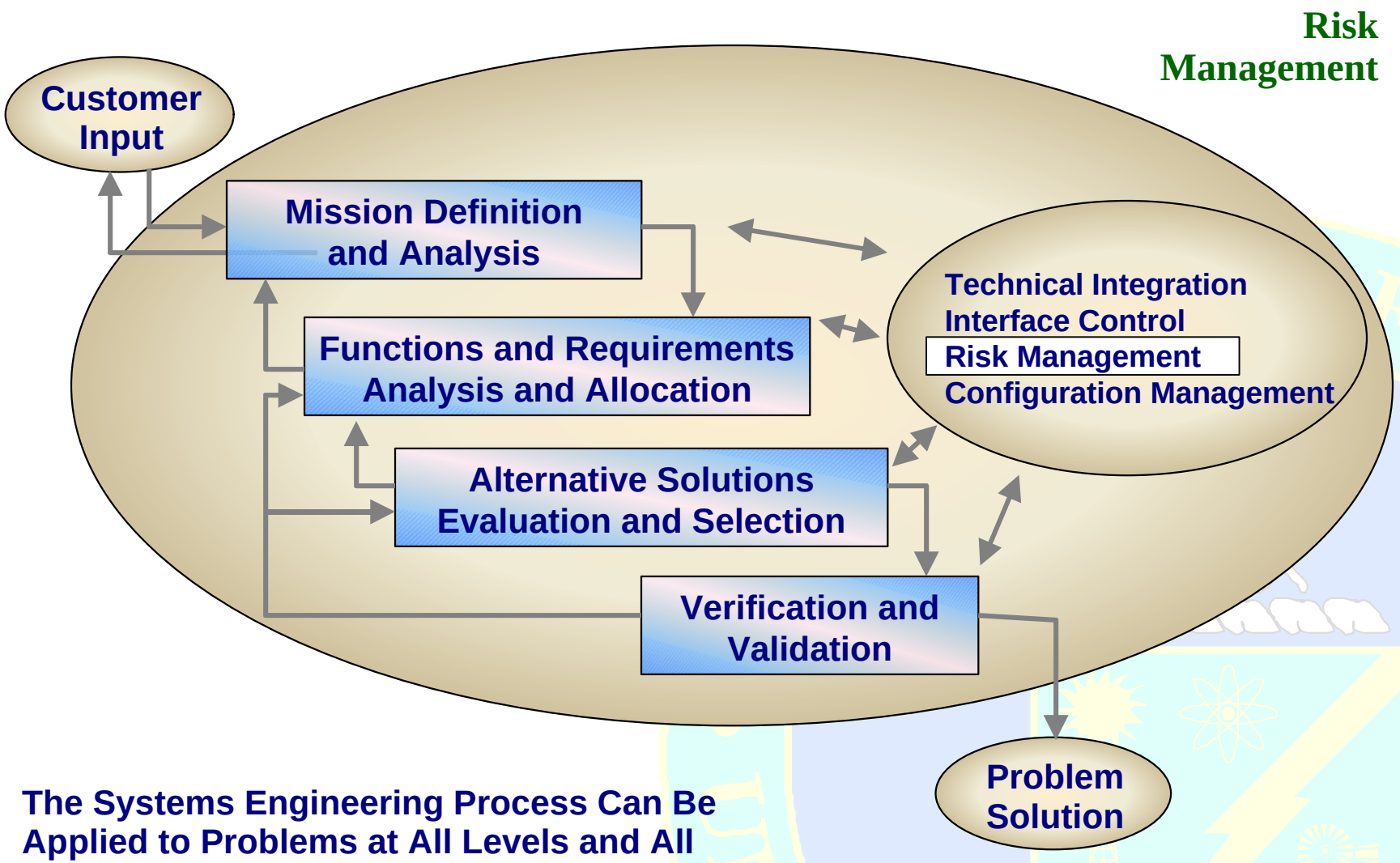



Why Risk Management?

- Focuses Attention on Technical and Programmatic Risks that have not Historically Been Accounted for In Projects
- Proactive Rather than Reactive
- Increases the Project Success Rate
- Avoids Surprises

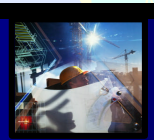
Systems Approach and Risk Management



The Systems Engineering Process Can Be Applied to Problems at All Levels and All Project Life Cycles

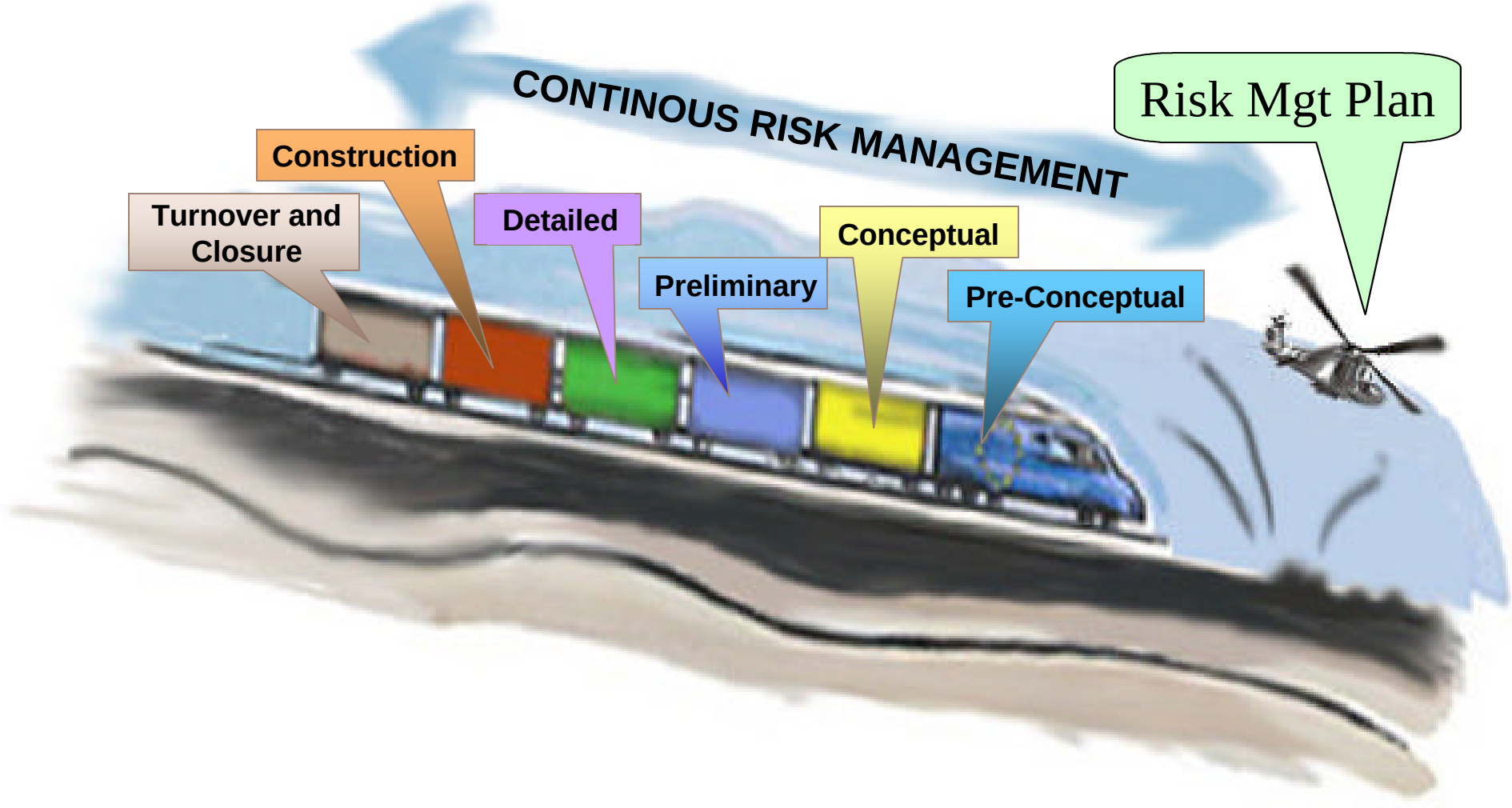
When is Risk Management Performed?

Active Risk Management from Initiation through the Entire Life Cycle can Significantly Decrease the Likelihood of Unanticipated Cost Overruns, Schedule Delays, and Compromises in System Quality

When is Project Risk Management Performed?

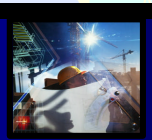
Risk Management Process Applied from Start to Finish



Who Performs Risk Management?

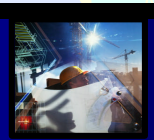
Risk Management Team

- Project Director, Project Manager or Manager
- Team Members
- Subject Matter Experts
- Trained Risk Management Facilitator(s)

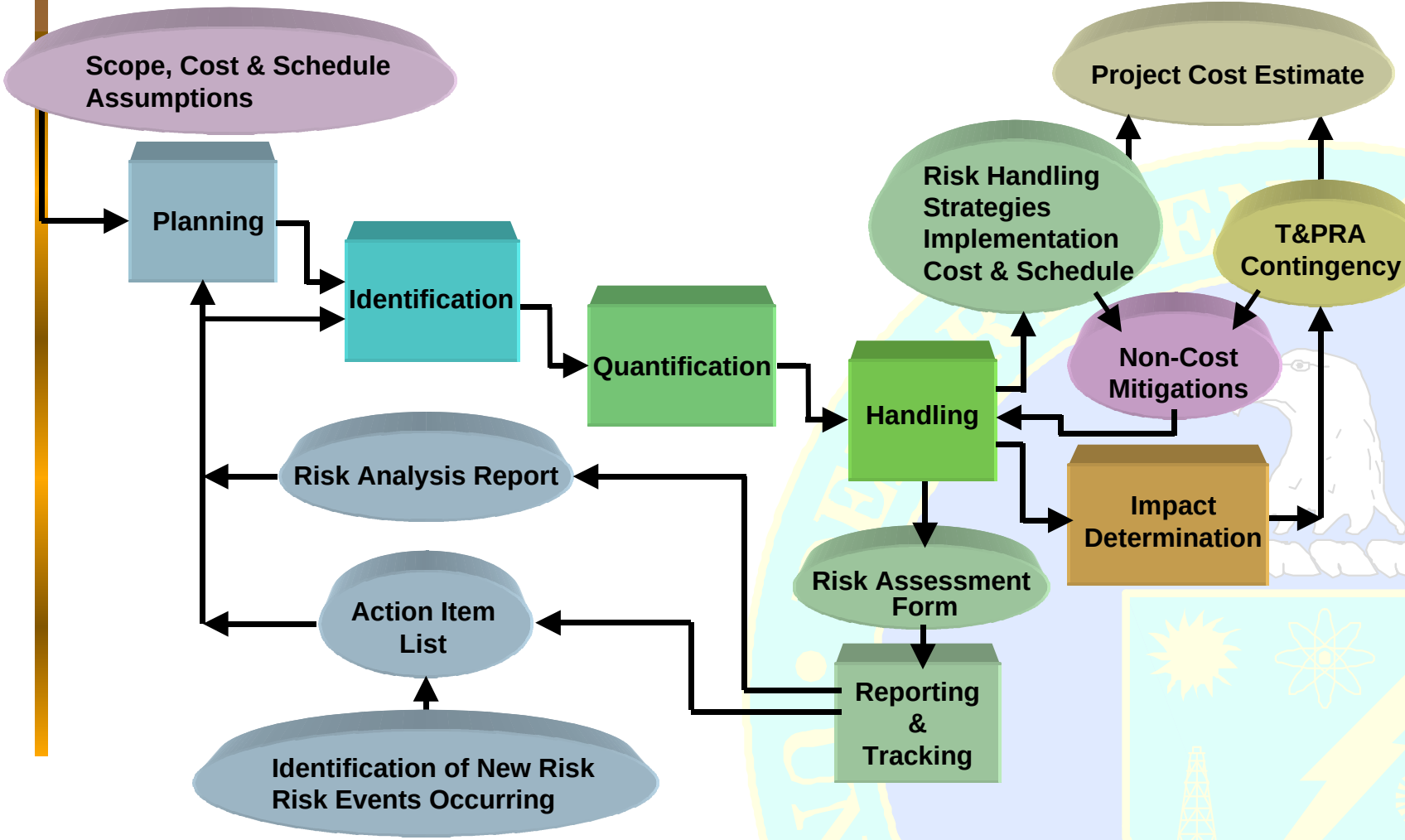



Risk Management Process

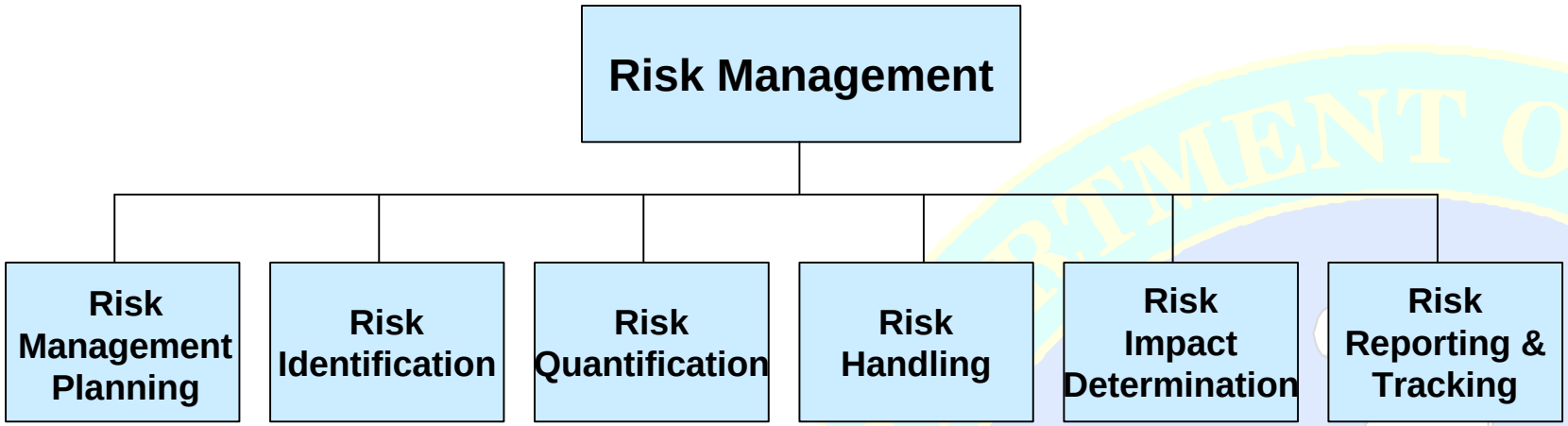
The Risk Management Process includes Planning, Identification, Quantification, Handling, Impact Determination, Reporting and Tracking of Risks. The Process is Applicable to Programs, Projects, or Activities

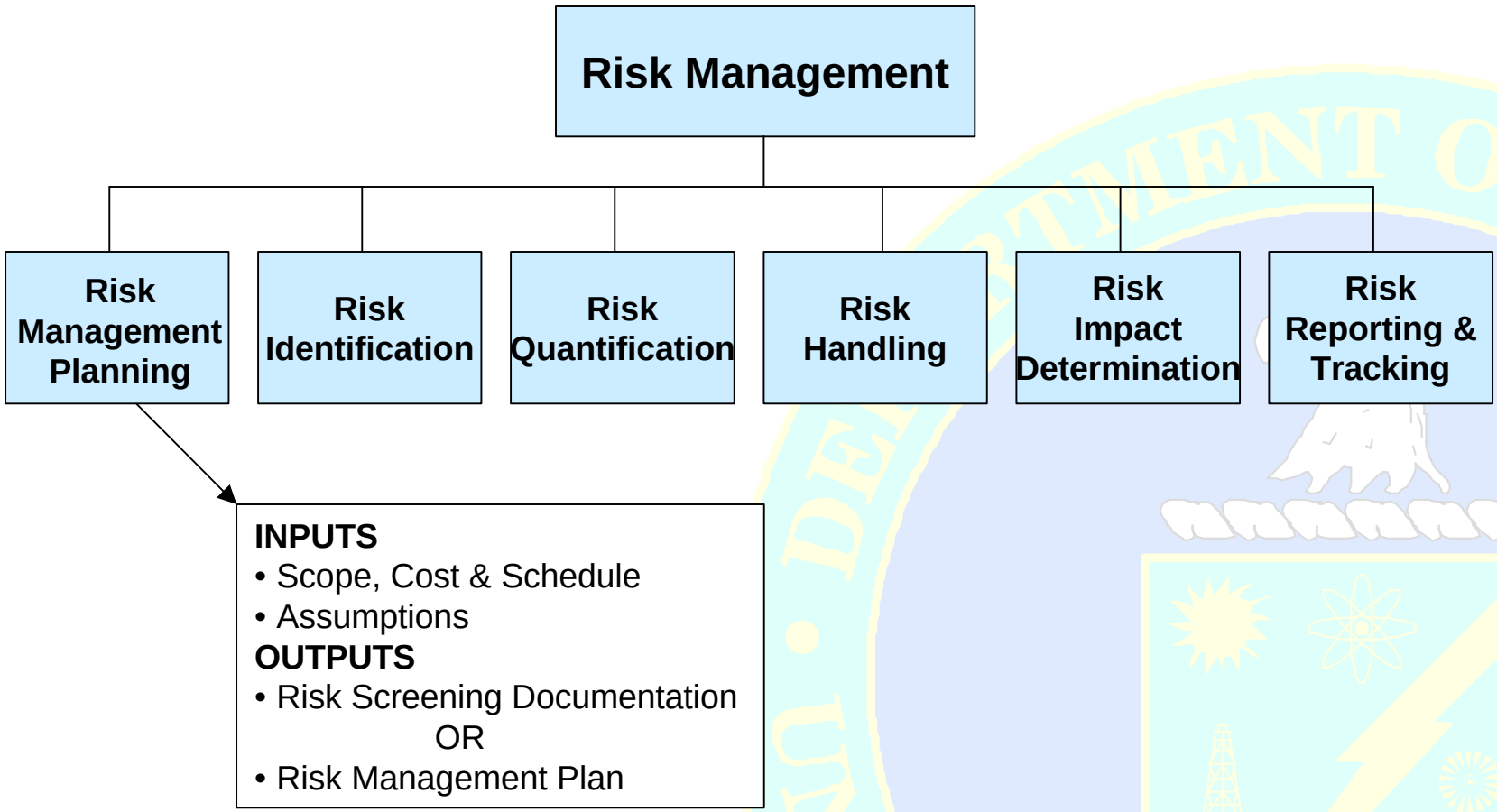
Risk Management Functional Flow Diagram



Elements of Risk Management

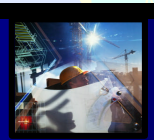


Elements of Risk Management



Risk Management Planning

Risk Management Planning Provides an Approach to Screen Activities for Potential Risks, and to Prepare a Plan to Assess and Manage Risks Throughout the Life of the Project

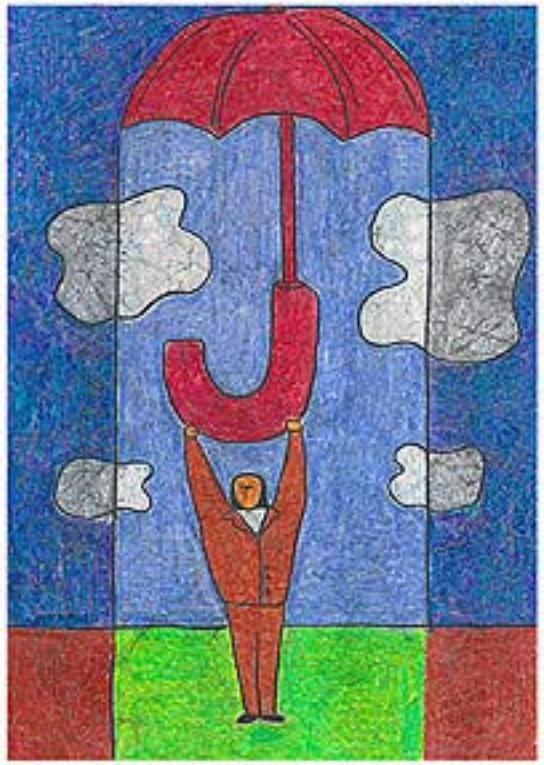



Risk Management Plan

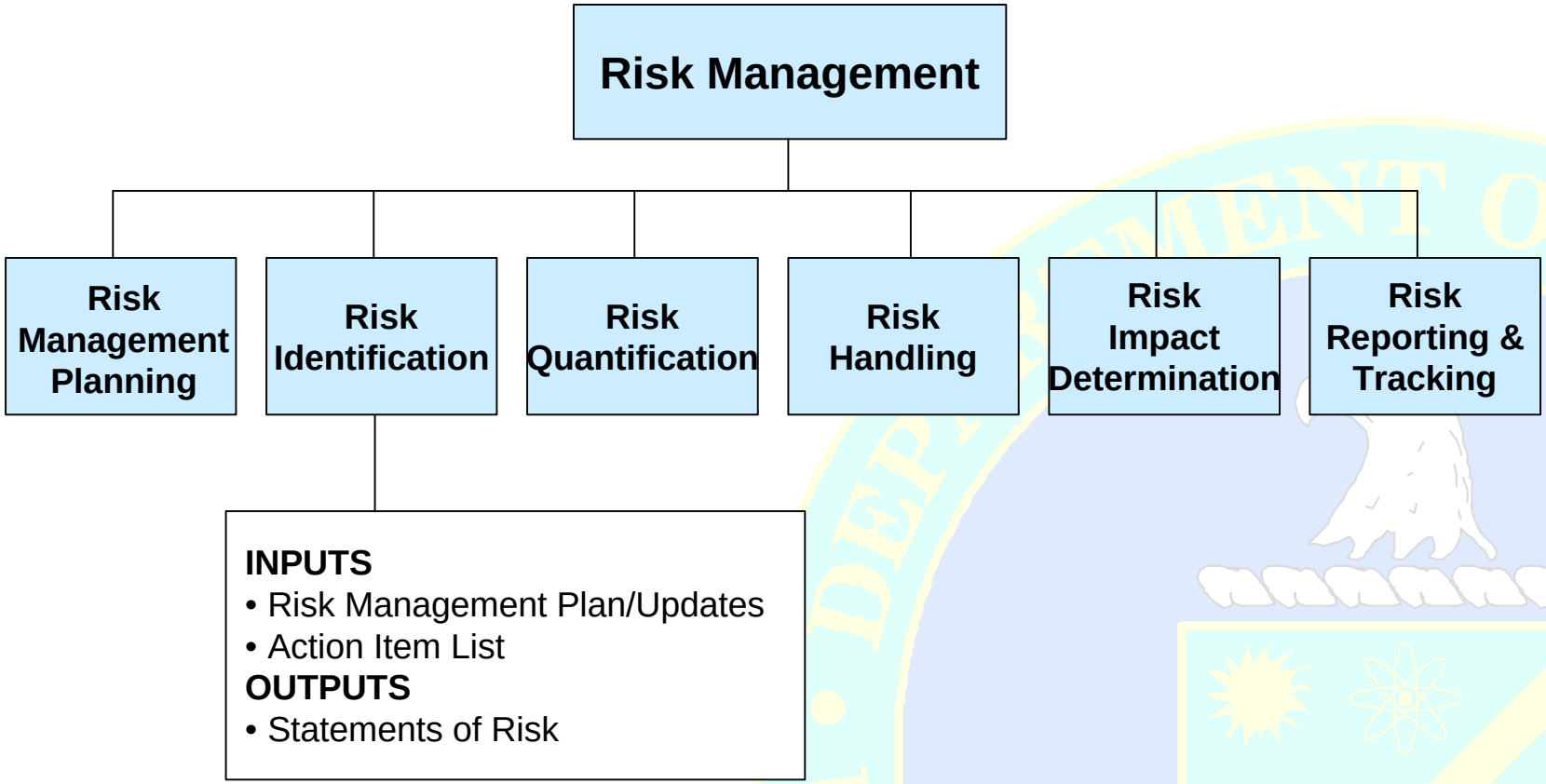
All Projects that Require a Risk Analysis Should Prepare a Risk Management Plan (RMP)

A RMP may:

- Be a Stand-alone Document and Referenced in the Project Execution Plan (PEP)
- Exist as a Section of the PEP

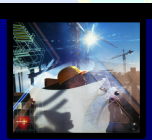


Elements of Risk Management



Risk Identification

Risk Identification is an Organized Approach for Determining which Events are Likely to Affect the Program, Project, or Activity, and for Documenting the Characteristics of those Events

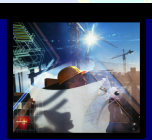



Methods of Risk Identification

1. Interviews, Team Brainstorming, Review of Lessons Learned

2. Risk Categories Checklist

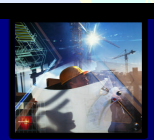
3. Flowcharting

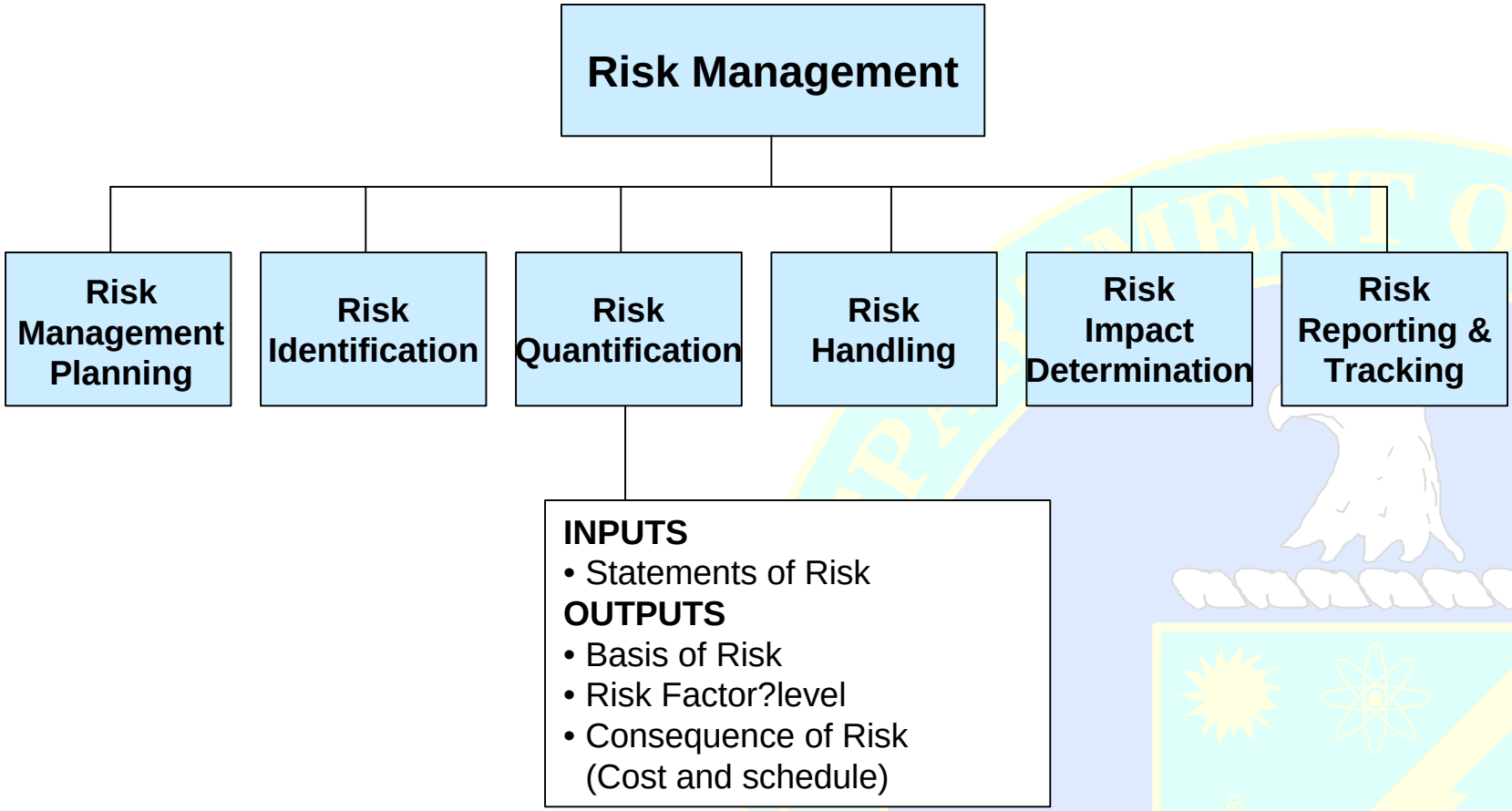
Statement of Risk

Clearly State the Risk and its Basis

- Identify the Risk Event or the Issue that Creates the Risk
- Why Does this Event Affect the Activity or Project?
- What Aspects of the Activity or Project are Affected
  - Performance?
  - Expenditures?
  - Schedule?

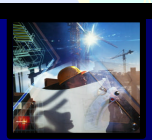



Elements of Risk Management



Risk Quantification

Risk Quantification is the Process of Evaluating the Probability that the Risk Event will Occur, and Assessing the Range of Possible Outcomes.

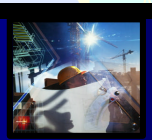
Risk Level Matrix (Typical)

Qualitative

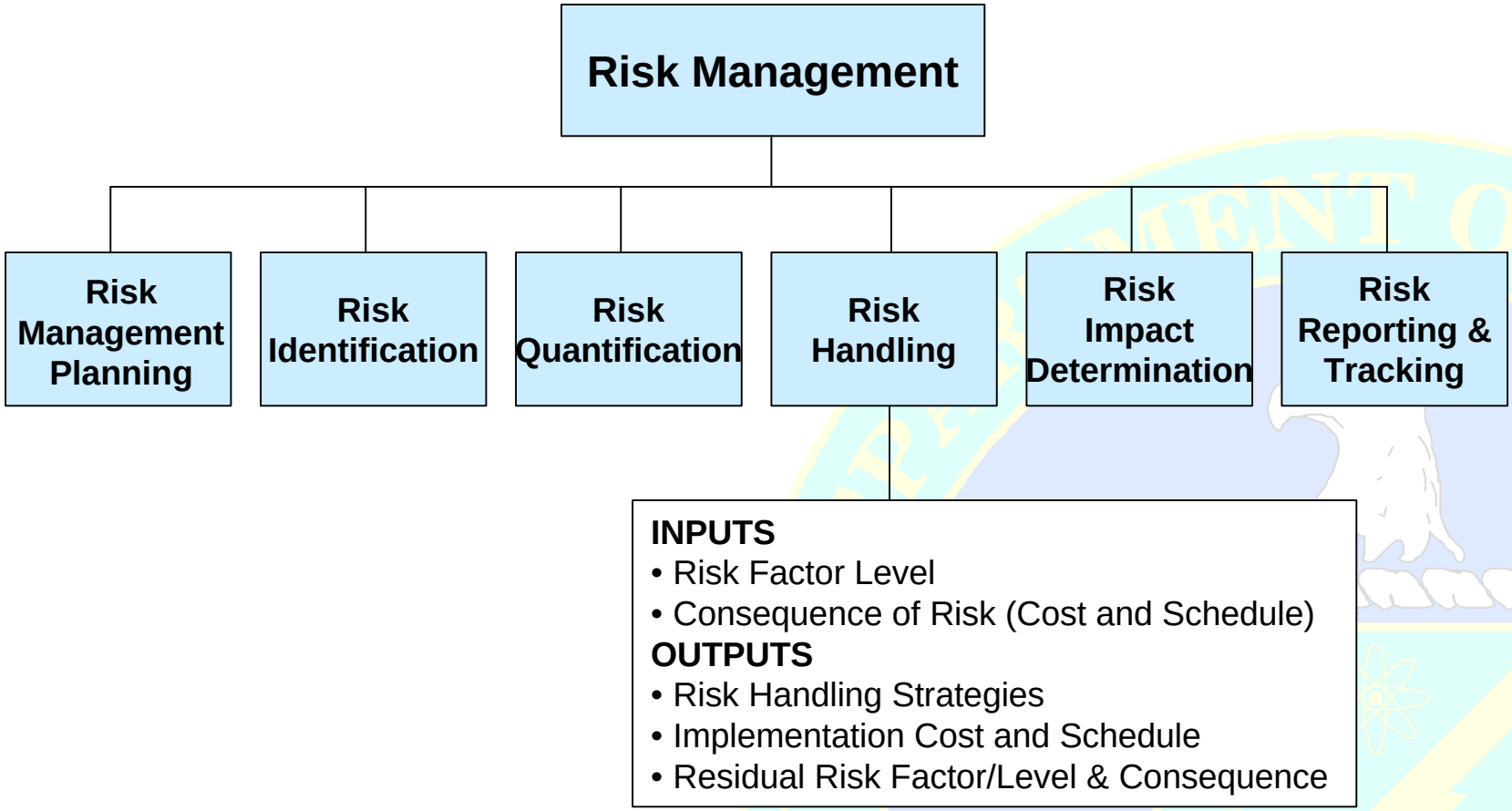
Risk Level

Probability of Risk Materializing	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	Low	Moderate	High	High	High
Likely	Low	Moderate	High	High	High
Unlikely	Low	Low	Moderate	Moderate	High
Very Unlikely	Low	Low	Low	Low	High

Severity of Consequence

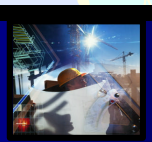



Elements of Risk Management



Risk Handling

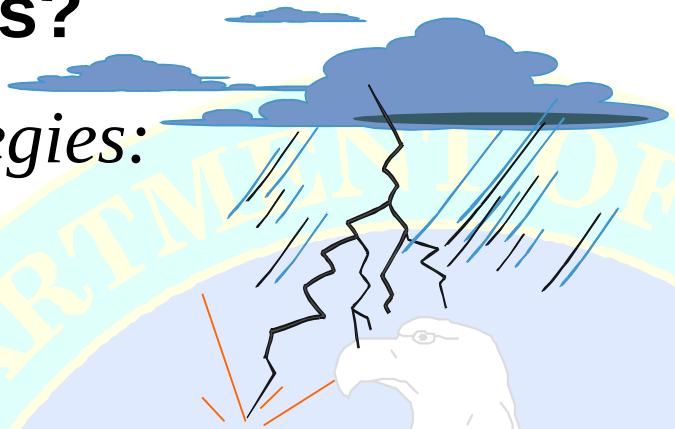
Risk Handling is the Identification of Specific Responsive Actions to Risks

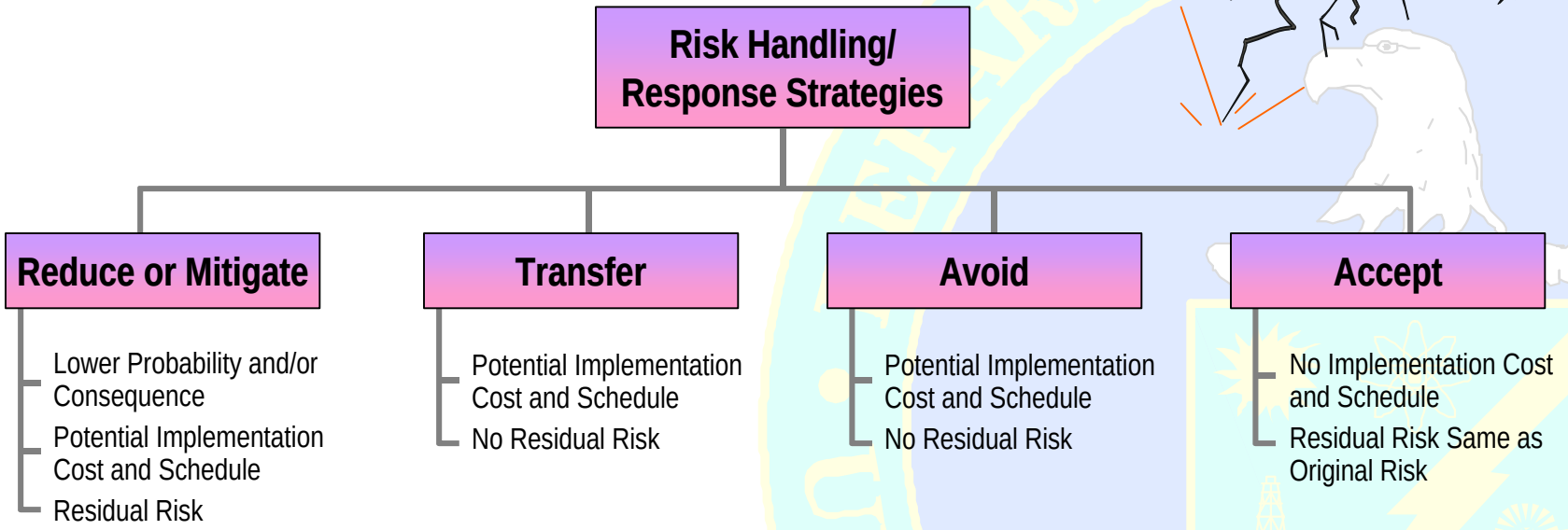



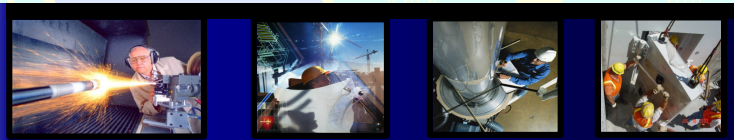
Risk Handling

What Are We Going to Do to Prepare Ourselves for the Bad Things?

Examples of Risk Handling Strategies:



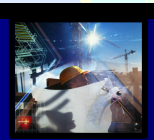




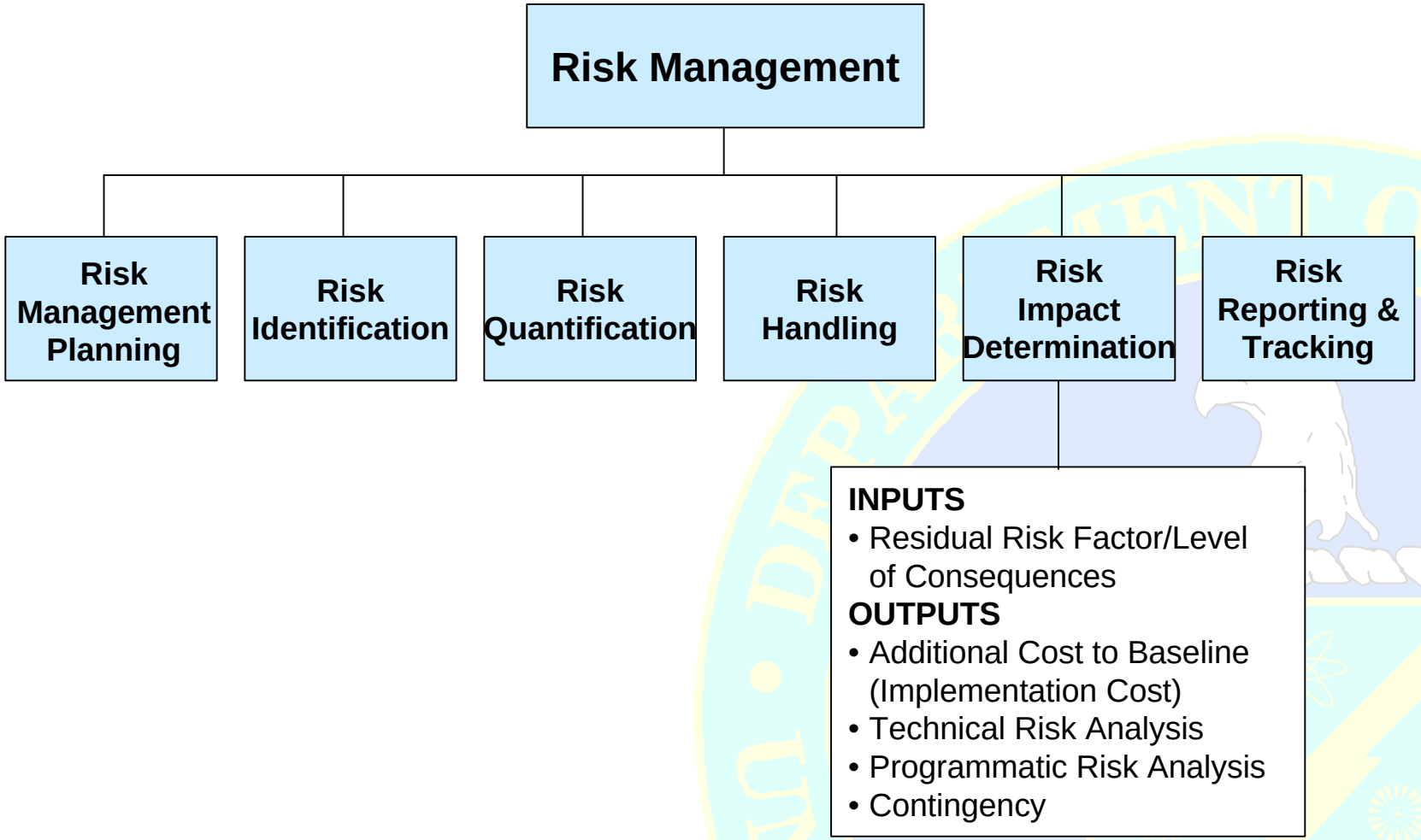
Risk Assessment Documentation

Documentation of Risk Identification, Quantification, and Handling

- Clear Statement of Risk
- Probability and Consequence with Basis
- Worst Case Cost and Schedule Impact
- Risk Factor/Level
- Handling Strategies/Specific Actions (if any)
- Handling Strategy Implementation Cost and Schedule
- Residual Probability, Consequence, Risk Factor / Level

Elements of Risk Management

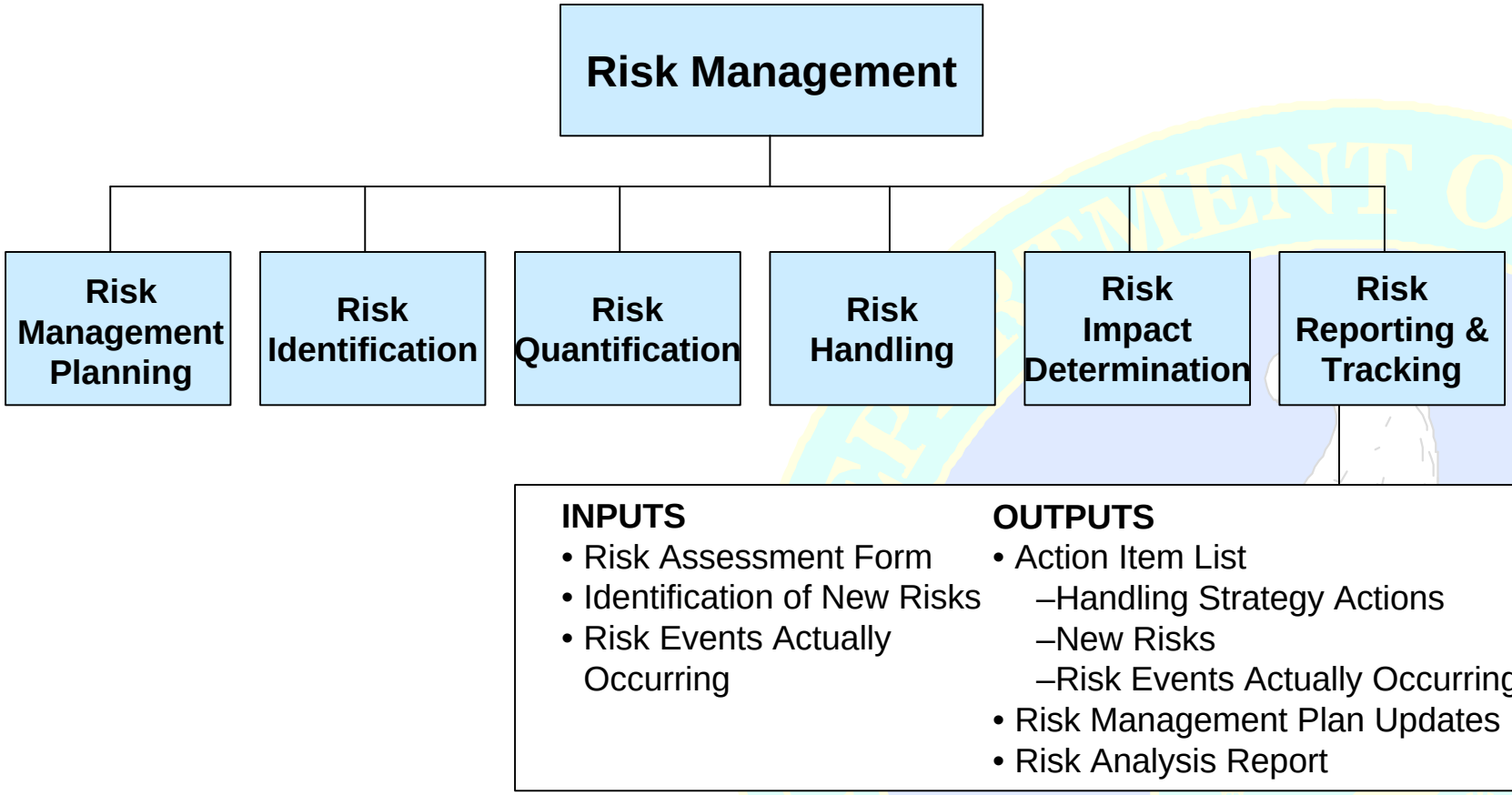


Risk Impact Determination

Assessing the Impact of Risk Events on Project Costs and Schedules

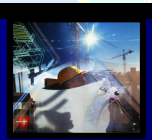
- Approaches that Can Be Employed to Determine Risk Impact on Project Costs and Schedules Include:
  - Monte Carlo Simulation
  - Employment of Beta and Triangular Distribution (Best Case, Worst Case, Most Typical Case)
  - Use of Decision/Probability Trees
  - Use of PERT/CPM Networks to Simulate Different "what if?" Scenarios

Elements of Risk Management



Risk Reporting and Tracking

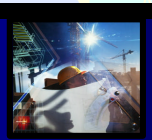
- ***Risk Reporting***: Documenting the Steps Taken to Prepare for Risk Events
- ***Risk Tracking***: Actively Monitoring Action Items Resulting from the Risk Analysis Process
  - Schedule Progress
  - Cost Progress
  - Test Results
  - Technology Transition Plans (from developer to user)

Risk Tracking

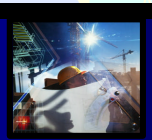
Project Action Item Tracking System

- Assigned Responsibilities for Handling/Response Actions
- Expected Closure Dates
- New Risks to be Considered
- Changes to Previous Identified Risks
- Risks that Have Occurred or Not Occurred

Lessons Learned

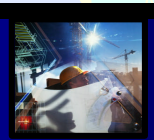
- Understand and Manage Risks Early from Pre-Conceptual Start
- Unknowns are Usually Risks
- Anticipate that Things Can Go Wrong
- Risk Identification and Quantification is the Most Critical Step in Risk Management
  - Requires Right Personnel or Risk Management Team
  - Assure there is No Double Counting Between T&PRA Contingency and Traditional Project Contingency
- Risk Tracking and Follow-up Analysis are Usually Ignored but Are the Real Key Steps to Success
- Management Commitment and Buy-in Is Essential for Success

Integrated Safety Management

An Integrated Safety Management System (ISMS) is Designed to Ensure that Environmental, Worker, and Public Safety are Appropriately Addressed in the Performance of Any Task.

Within the Project Environment, an ISMS Must be Developed at Two Levels: Performing Physical Work and Design for Safety. The Differences Lie in the Specific Implementation of Each

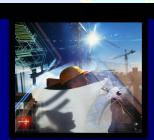



What is ISM?

Integrated Safety Management

It is a Proactive Safety Culture that:

- Incorporates an Integrated Approach to Safety Management that Ensures Work is Planned, Analyzed, Reviewed, Approved, and Executed in a Safe Manner
- Includes a Continuous and Sequential Process Integrated into Organizational Culture and Individual Behavior
- Makes Safety Happen → At All Levels Under All Conditions

Integrated Safety Management

Integrated Safety Management

DOE Direction

Define Scope of Work

- Translate Mission Into Work
- Set Expectations
- Prioritize Tasks and Allocate Resources

Analyze Hazards

- Identify and Analyze Hazards
- Categorize Hazards

Develop Controls

- Identify Standards & Requirements
- Identify Contracts to Prevent/Mitigate Hazards
- Establish Safety Envelope

Perform Work/Design

- Confirm Readiness
- Design for Safety
- Perform Work Safely

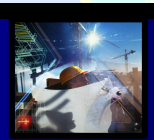
Feedback/Improvement

- Collect Feedback Information
- Identify Improvement Opportunities
- Make Changes to Improve

Do Work Safely

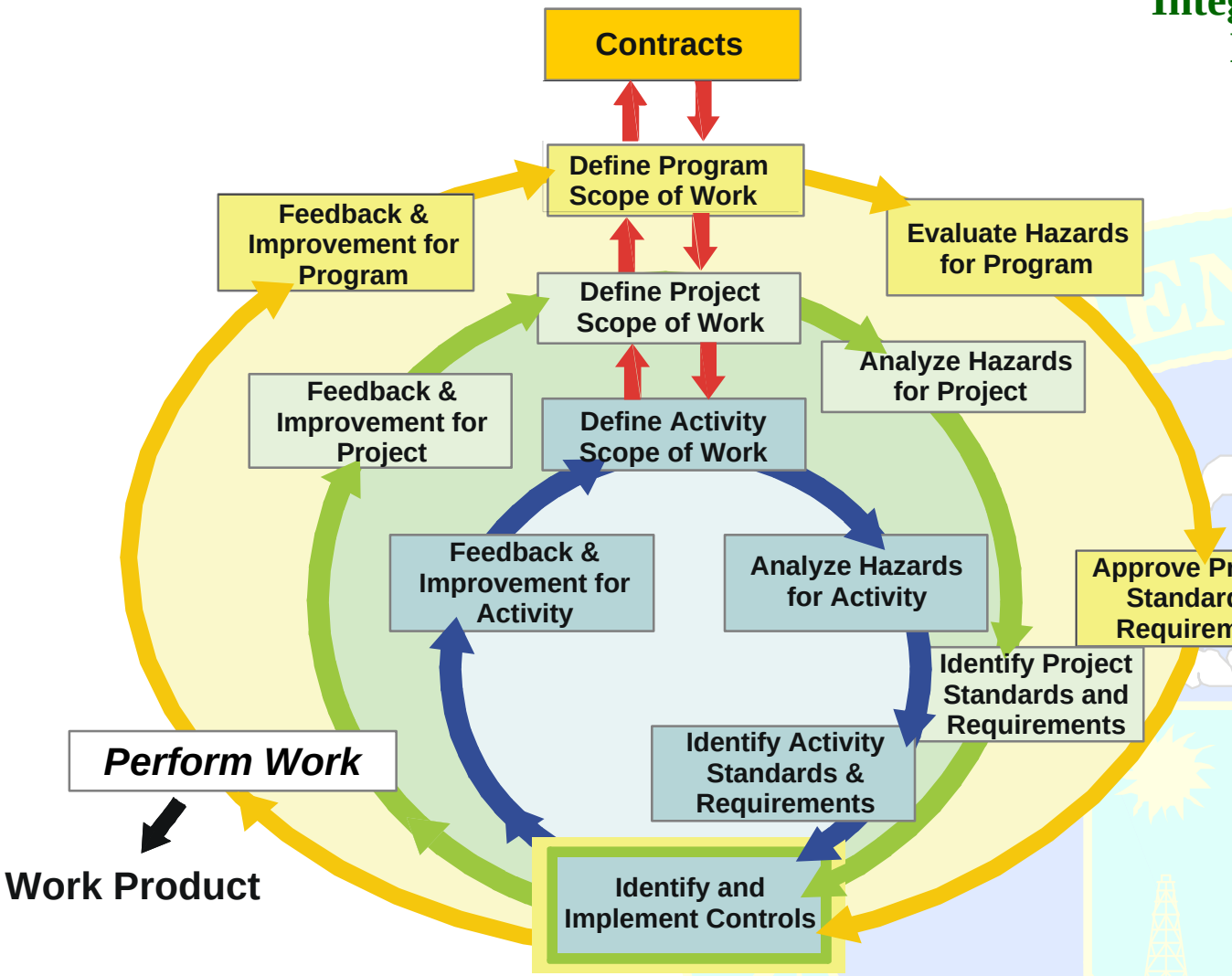
Design for Safety

Work Product

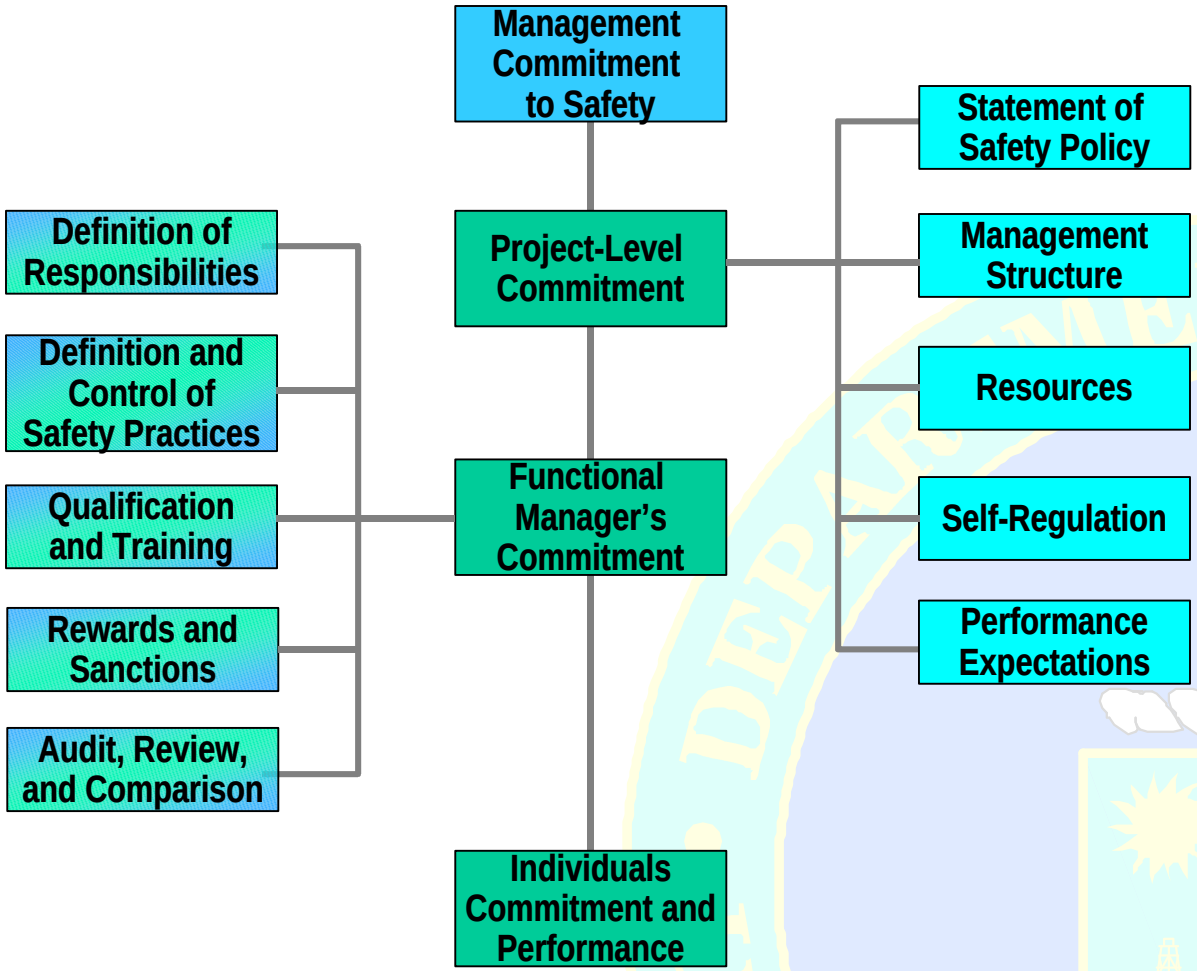
ISM Applies at All Levels

Integrated Safety Management



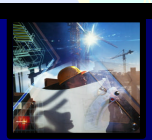
Safety Culture Components

Integrated Safety Management



ISM Responsibilities

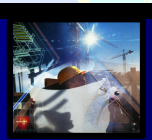
- Clearly Defined in Documents Appropriate to the Activity
- Responsibilities are Established in
  - Directives
  - Contracts
  - Regulations
  - Agreements
- Functional Management is the Key

ISM and Risk Management Elements

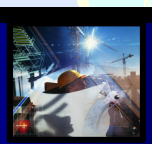
Integrated Safety Management

Integrated Safety Mgmt.	Risk Management
1. Define Scope of Work	1. Identify Hazards
2. Analyze Hazards	2. Assess Hazards
3. Implement Controls	3. Implement Controls
4. Perform Work	4. Implement Controls
5. Feedback/Improvement	5. Supervise

Exercise

Discuss Integrated Safety Management & Risk Management Chart

Safety Management Through Design

Integrated Safety Management

Goal:

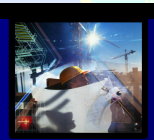
Safety is "Designed In" Instead of "Added On"

- Eliminate Hazards
- Minimize Hazards
- Mitigate Consequences
- Precludes Events

Methods:

- Safety Analysis Report
- Hazard Analysis
- Fire Hazard Analysis
- Emergency Response Evaluations

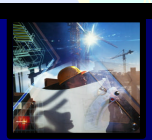
Final Design Meets Mission and Safety Requirements

Project Planning

Project Execution Plan

- Address Integrated Safety Management (ISM) Implementation Plan for
  - Routinely Assess ISM
  - Document Level of Safety Documentation
  - Develop Agreement with Regulatory Body
  - Establish Operational Interface for Hazard Analysis Input

Quality Management

The Effective Management of Quality is Important for Two Reasons:

- ***The Link Between Quality and Safety is Strong.*** Clearly, shoddy workmanship, poor testing, and sloppy inspection—all reflections of poor quality—can lead to serious safety problems.
- ***The Link Between Quality and Customer Satisfaction is Strong.*** In today's customer-focused business climate, customers are looking for vendors who produce high-quality goods and services. In fact, the ISO definition of quality is predicated on the view that "Quality is What Customers Perceive It to Be."

Quality Planning

ISO 9000

Non-nuclear

Specification Type

Control Charting

10 CFR 830

ANSI N45 NQA-1

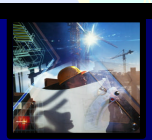
Nuclear

Performance-Based

18 Criteria

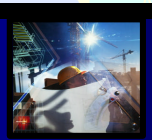
NQA-1 Quality Assurance Requirements

- Based on 10 CFR 50 Appendix B for Power Plants and Reprocessing Facilities
  - 18 Basic Requirements
  - Supplements
  - Non-mandatory Guidance
- Intentionally Arranged So It Can Be Applied In Whole or In Part
- Based on the Nature and Scope of Work and the Importance to Safety Mission

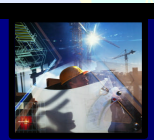
NQA-1 Quality Assurance Requirements (cont.)

- Graded Approach Used to Determine the Requirements Imposed and the Depth and Rigor—Based on Importance
- Emphasis on Planning and Verifying Quality as Part of the Work Scope, Not an Auxiliary Function

Major Processes of Contracting and Control Management

- Acquisition Planning
  - Determining What to Procure and When
- Solicitation Planning
  - Documenting Product Requirements and Identifying Potential Resources
- Solicitation
  - Obtaining Quotations, Bids, Offers, or Proposals as Appropriate
- Source Selection
  - Choosing from Among Potential Sellers
- Contract Administration
  - Managing the Relationship with the Seller
- Contract Closeout
  - Completion and Settlement of the Contract, Including Resolution of any Open Items

Contract Types

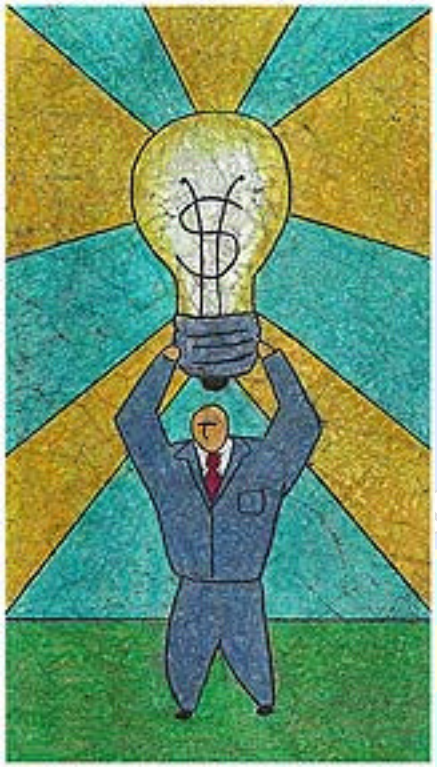
- Unit Based
  - The Seller is Paid for Each Unit of a Good Delivered
- Performance-Based Contracting
  - The Seller is Paid to Produce Defined Results as the Results are Delivered—Attention Focuses on *What* Should be Produced, Not *How* it Should be Produced
- Design
- Build
- Build to Print
- Material Procurement
  - Bulk
  - Commercial Grade

Contract Types (cont.)

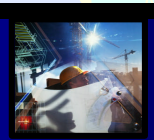
- Firm Fixed Price (lump sum)
- Cost Reimbursable/Cost Plus
  - Cost Plus Fixed Fee
  - Cost Plus Incentive Fee
  - Cost Plus Award Fee
  - Time and Materials

Acquisition Planning

Ensure that the Government Meets its Need in the Most Effective, Economical, and Timely Manner

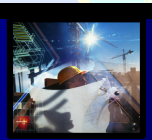


- Identify Integrated Project Teams (Tailored)
  - Project Director
  - Contracting Officer
  - Technical Experts
  - Logisticians
  - Financial
  - Legal
- Review and Evaluate Entire Procurement Process

Acquisition Planning (cont.)

- Plan for Each Contemplated Contract
- Address Significant Considerations
- Develop Written Acquisitions and Address:
  - Schedule/Milestones
  - Technical Considerations
  - Cost
  - Risks and Risk Mitigation

Applicable Laws and Regulations

- Davis Bacon Act
- Competition in Contracting Act
- Small Business Act
- Service Contract Act
- Brooks Act
- Freedom of Information Act
- Foreign Ownership, Control, or Influence
- Organization Conflict of Interest
- Anti-Deficiency Act
- Anti-Kickback Act (Copeland Act)
- Federal Acquisition Regulations (FARs)
- Regulations (DEARs)
- Truth in Negotiations

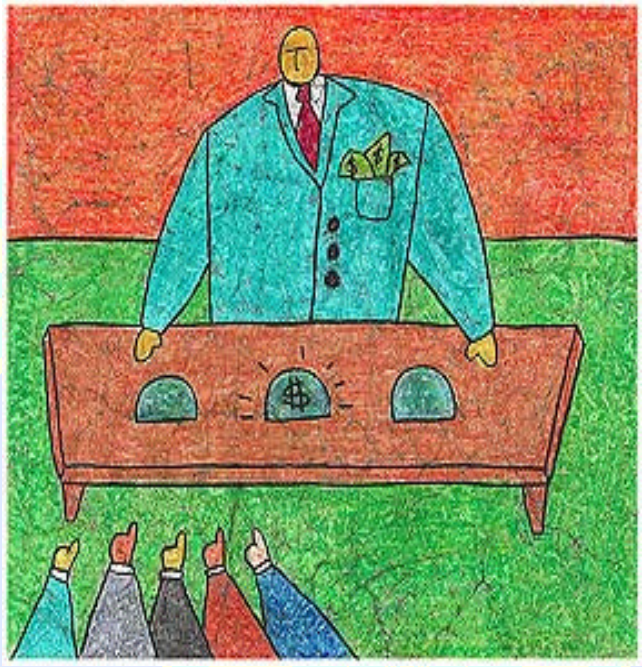
Applicable Laws and Regulations (cont.)

- Price-Anderson Amendments Act
- DOE Acquisition
- OSHA Regulations
- Executive Orders
- More!

- Environmental Regulations
  - Comprehensive Environmental Response, Compensation, and Liability Act
  - Resource Conservation Recovery Act
  - Clean Air Act

Successful Contract Management

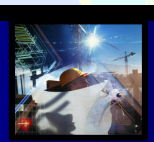
Successful Contract Management in the DOE Arena Requires Comprehensive Understanding of:

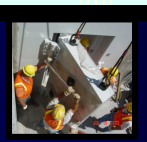


- Primary Contract and Any Applicable DOE Pass-through Requirements
- The Desired Product
- Local Labor Conditions
- Local Socioeconomic and Site Agendas
- Acceptable-Unacceptable Risks
- Supplier Motivation
- Field Conditions
- Terms & Conditions Imposed by Site-Specific Boiler Plate
- In-process Subcontract Controls
- Startup, Turnover, and Warranty Requirements

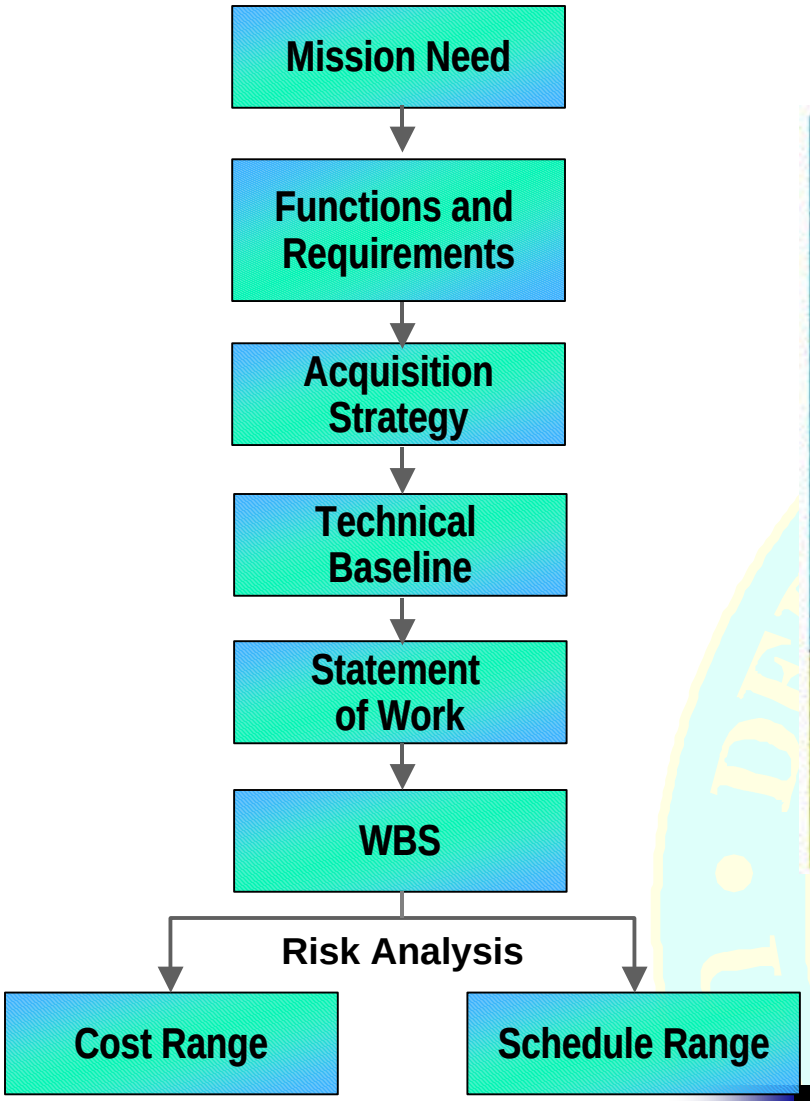
Exercise

- Develop an Acquisition Strategy for Sample Project
- Perform a Risk Assessment or Acquisition Strategy

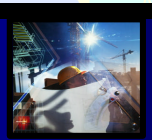


Cost and Schedule Ranges



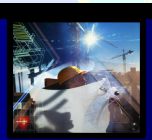
Conceptual Cost and Schedule Ranges

- Based on Selected Alternative
- Tailored to Maturity of Design
- Allowance and Contingencies are Risk-Based
- Assumptions are Well Documented

Preliminary Project Execution Plan

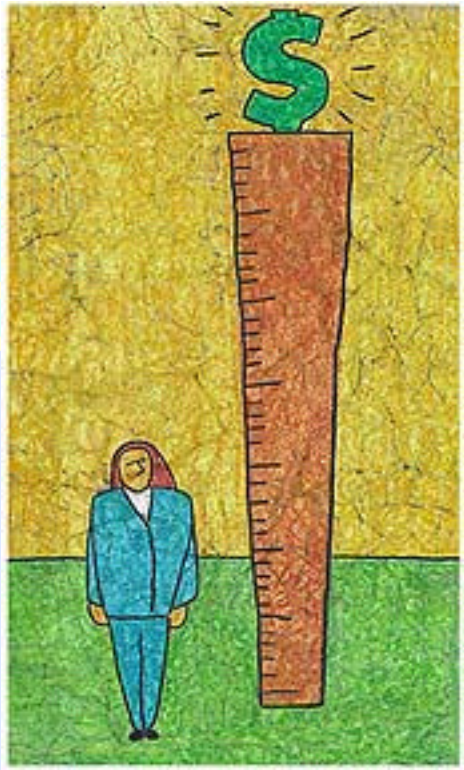
- Developed Using an Integrated, Systematic Approach
- Accurately Reflects the Manner in which the Project will be Managed and Performed
- Project Participants' Responsibilities, Authorities, and Accountabilities
- Work Breakdown Structure and Dictionary
- Assignment Matrix by Interfacing the Organizational Breakdown Structure with the Work Breakdown Structure
- Time-phased Budget or Resource-Loaded Schedule
- Establish Project Activity Durations
- Resource-Loaded Project Activities
- Risk Assessment and Mitigation Planning
- Preliminary Order of Range Project Cost Estimate
- Progress (performance) Measuring and Reporting System
- Method to Communicate Results, Reviews, and Revisions of Project Documentation to Project Participants and Stakeholders

CD-1 Package

Alternative Selection and Cost Range Reviews

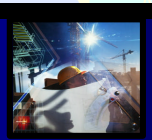
- Key Review Elements
  - Alternative Analysis
  - System Functions and Requirements
  - Acquisition Strategy
  - Risk Management
  - Hazard Analysis
  - Preliminary Cost and Schedule Estimate
- Required Documentation
  - Conceptual Design Report
  - Risk Management Assessment
  - Safety Documentation
  - Acquisition Strategy



Execution Phase—

Establish the Performance Baseline

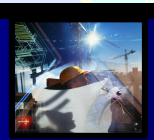
- Integrated Project Team
- Cost Estimating
- Schedules
- Resource Planning
- Earned Value Management System
- Performance Measurement
- Control
- Preparing for Critical Decision-2
- Change Control
- Approve Performance Baseline—Critical Decision-2

Integrated Project Team

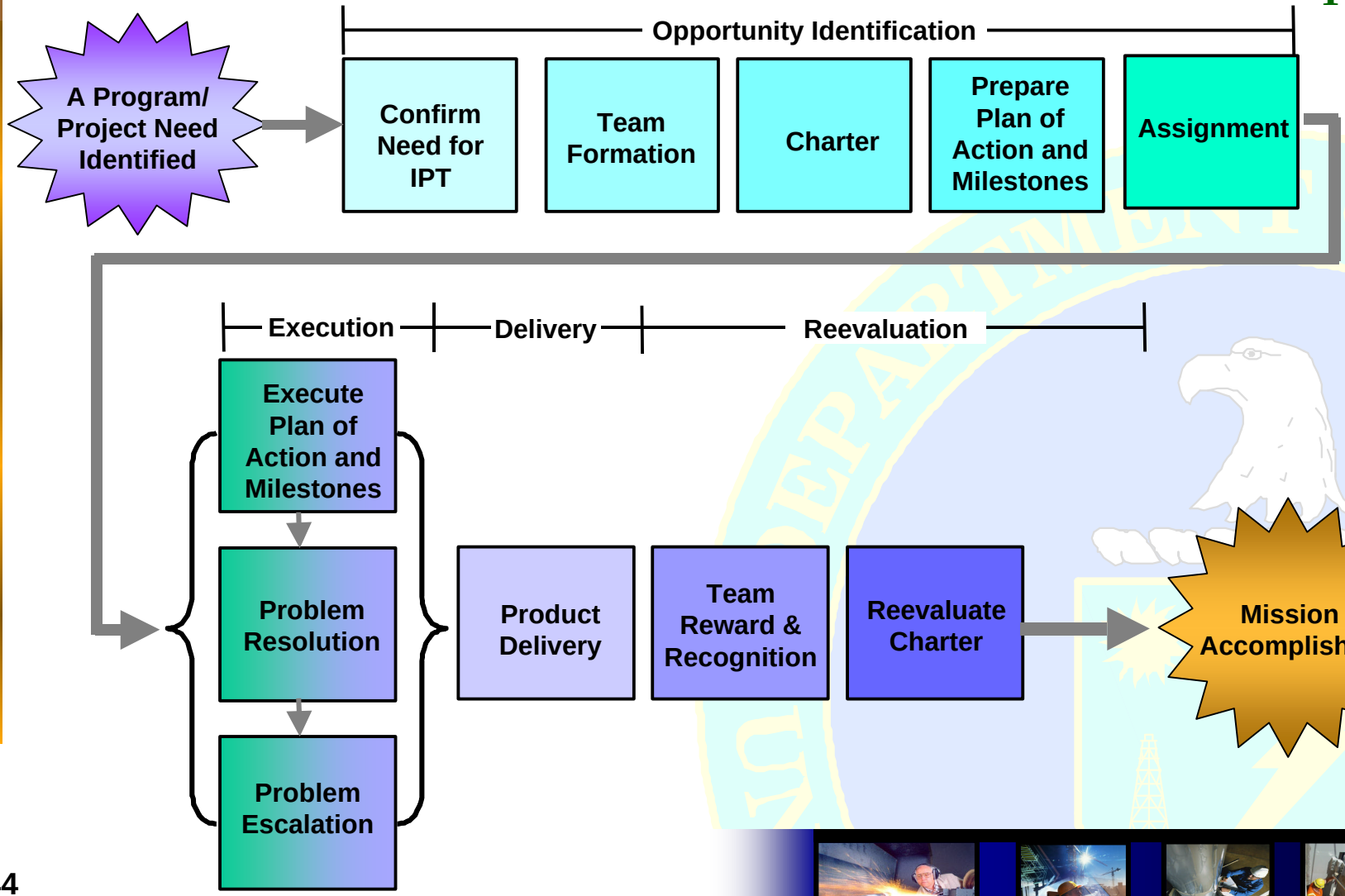
DOE Manual 413.3-1

- "The Integrated Project Team is an Essential Element of the Department's Acquisition Process and Will be Utilized During All Phases of a Project Life Cycle."
- As a Project Progresses from Initiation to Transition/Closeout, the Integrated Project Team Membership will Change to Incorporate the Necessary Skills and Expertise Required."

Typical IPT Process Model

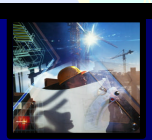
Integrated Project Teams



Forming an IPT

Integrated Project Teams

1	2	3	4
Team Charter and Selection	**Team Working Environment**	**Team Charter Kick-Off**	**Team Charter and Selection**
▪ Charter and Goals ▪ Team Leader ▪ Team Members ▪ Sub-Team Leaders ▪ Facilitator	▪ Collocation ▪ Facilities ▪ Team Rooms ▪ Electronic Mail ▪ Video Tele-conferencing ▪ Team Leader Training (as required)	▪ Team Building ▪ Metrics ▪ Tools and Processes ▪ MNS/AS/PEP	▪ Team Dynamics ▪ Tools ▪ Product/ Technology Development

How an IPT Operates

Integrated Project Teams

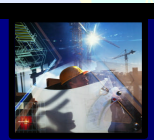
Establishing and Executing High Performing IPTs Require Skilled Leaders and an Organizational Culture that Exhibits Openness and Trust Among its Members

- ***Opportunity Identifier Need.*** An opportunity is identified that requires IPT resolution or assistance. Key stakeholders are identified and a systematic process of developing a clear charter with outcome expectations is defined. The team members are assigned by the PD/PM to resolve the opportunity at hand.
- ***Execution.*** Working as an IPT, team members prepare a plan to develop and address issues. Most issues should be discussed and resolved within the IPT environment. When issues cannot be resolved, problems are escalated for senior management intervention.
- ***Delivery.*** As issues are resolved and the plan executed, the IPT completes and delivers its chartered outcome requirements.
- ***Reevaluation.*** Upon delivery and review with the PD/PM, the IPT provides necessary feedback to members and evaluates the need for continuation of the IPT. If requirements are fulfilled, the IPT is disbanded.

IPT Leader Responsibilities

Integrated Project Teams

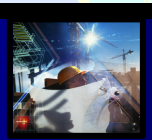
- Preparation and Maintenance of Team Charters, and IPT and Project Procedures
- Provide the IPT with Broad Guidance, and Delegate Decision-making Authority and Limitations of Authority to Each IPT
- Provide Allocated Budget
- Maintain a Project Environment that Rewards Team Success
- Serve as the IPT Leader
- Provide Needed Orientation and Training for Personnel Assigned to the Team

IPT Leader Responsibilities

Integrated Project Teams

- Keep Management and Stakeholders Informed
- Manage the Day-to-Day Performance of the IPT, and Provide Inputs to the Functional Leaders for Assigned Team Members' Annual Performance Appraisals
- Ensure that Decision-making Within the Team is Not Dominated by One Functional Area
- Speak for the Team, Communicate Project Requirements to the Membership and Resource Requirements to the Acquisition Executive and Functional Leaders

Integrated Project Team Charter

A charter should:

- Contain a clear mission statement, to include the specific purpose and objectives of the IPT;
- Provide recognition of the purpose of the IPT in a larger context;
- Identify the product, process, or service to be provided;
- Identify the customer or recipient of the product, process, or service;
- Identify the timeframe by which the product is to be produced, the process completed, or the service provided;
- Identify IPT membership, to include all the cross-functional disciplines necessary to achieve the objectives of the IPT and to produce the product, complete the process, or provide the service;
- Consider any need for training of the IPT members, particularly those new to the IPT process;
- Address membership performance objectives that characterize high-performance IPTs;
- Address product ownership and membership accountability and responsibility;
- Address the use of metrics as a means of creating and maintaining team focus;
- Provide for membership coordination and communication;
- Embody:
  (a) The three basic tenets of IPTs;
  (b) The roles and responsibilities applicable to all IPTs; and
  (c) The six operating principles for implementing success-oriented IPTs;
- Be approved by appropriate authority;
- Provide for its own periodic review for adequacy, currency, or rescission.

A charter may:

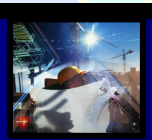
- Provide for performance feedback to cross-functional members' supervisors;
- Provide recognition that team composition may change over time, while maintaining a necessary core composition;
- Provide for a member recognition program that characterizes high-performance IPTs.

A charter should not: be unduly lengthy.

Roles and Responsibilities

Integrated Project Teams

- Project Director
  - Leader of the Team
  - Maintains Team Charter
- Project Team Members
  - Support Project Director
  - Develop Acquisition Plan
  - Define Project Baselines
  - Identify Project Interfaces
  - Prepare Project Documents
  - Provide Project Status
  - Provide Input to Project Reports
  - Attend and Participate in Project Reviews
  - Support Change Control
  - Support Operational Readiness
  - Review and Assessments

Three Basic Tenets

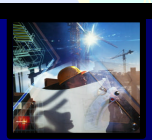
Integrated Project Teams

- The Project Manager is In Charge of the Project
- Integrated Project Teams are Advisory and Implementation Bodies to the Project Manager
- Direct Communication between the Project Office and All Levels in the Acquisition Oversight and Review Process is Expected as a Means of Exchanging Information and Building Trust

Operating Principles

Integrated Project Teams

- Chartering, Launch, Initiation
- Goal Alignment
- Open Discussion
- Empowered Qualified Team Members
- Dedicated/Committed Practice Participation
- Issues Raised and Resolved Early

IPT—Maintains Focus

Integrated Project Teams

IPTs Manage Cost, Schedule, and Technical Performance

- Members Need to Maintain Proper Balance Between Optimism and Achievability
- Members Should be Event Driven
- Members Must Manage Requirement/Design Tradeoffs
- Members Must Manage Project Risks
- Members Must Maintain Distinction Between Government and Industry (Contracts)
- IPTs Evolve During the Execution Phase
- New Membership is Expected
- Operations/Startup Must be Involved Early in the Execution Phase
- Roles Change During Transition and Startup

Ongoing Assessment and Training of IPTs is Critical for Success!

IPT Evaluations

- To What Extent Do Team Members:
  - Fully and freely participate in IPTs
  - Engage in open, frank, and forthright discussions
  - Come prepared
  - Leave the meeting ready to discuss/address the results with their organizations

- Ask to What Extent:
  - Is there consistent IPT participation by primary functional area members
  - Are member positions on issues known
  - Are positions revised by a functional area superior

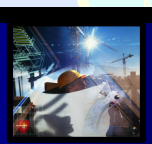
IPT Evaluations (cont)

Integrated Project Teams

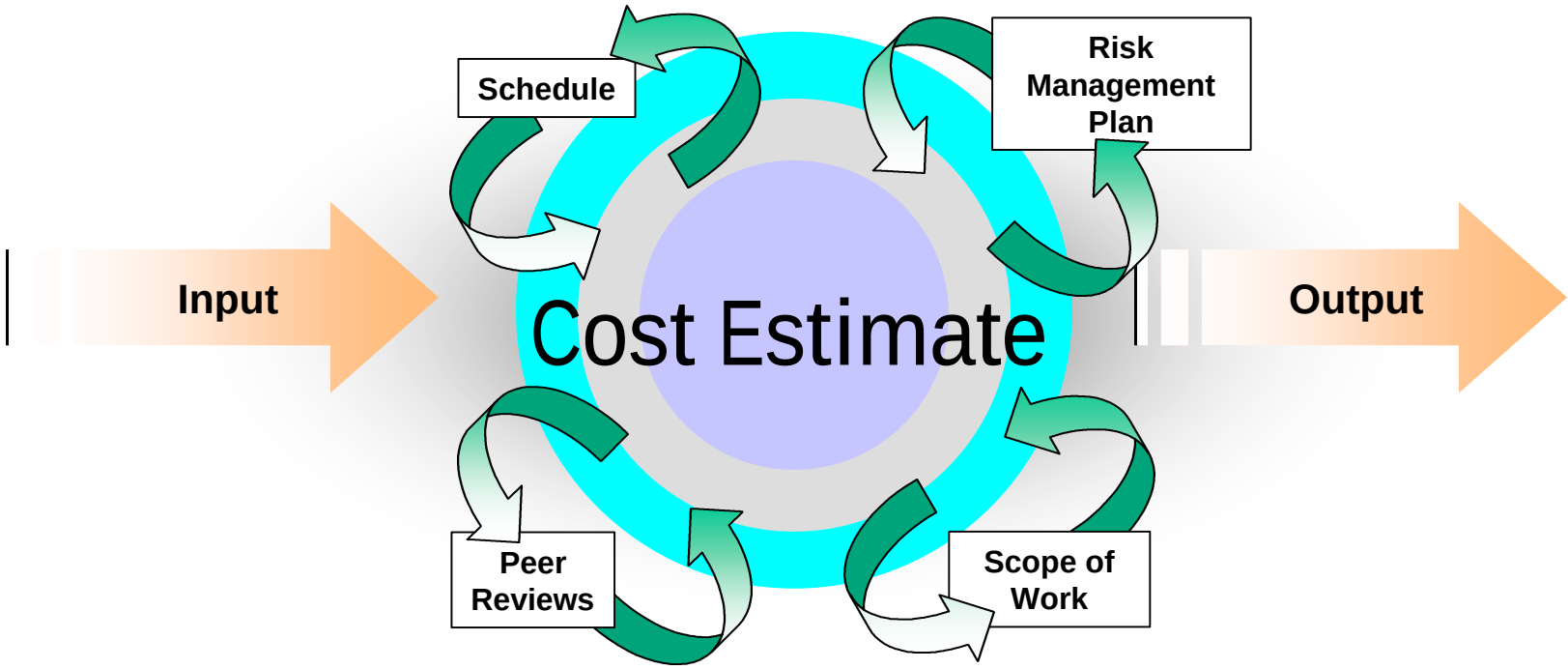
- Ask to What Extent Are:
  - Team and team member performances assessed Potential Metric: Trend analysis of functional area issue resolution and team member performance through action item records/meeting minutes
  - Consistent representation from functional areas available Potential Metric: Record attendance
- To What Extent Do:
  - Surprises arise from upper level management
  - Issues get resolved at IPT level
  - Issues get elevated beyond IPT
  - Unresolved issues affect the Plan of Action and milestones

Exercise

Outline a Team Charter for Sample Project

Cost Estimating Process



Cost Estimates, Schedules, Risk Management Plans, and Peer Reviews are Closely Related. None Shall Stand Alone!

Bottom-up Estimate

Derived From Work Breakdown Structure (WBS)

1.1.0 Excavation

- 1.1.1 Equipment ($1,200)
- 1.1.2 Work ($2,500)

1.2.0 Framework

- 1.2.1 Materials ($4,500)
- 1.2.2 Work ($6,200)

1.3.0 Wiring

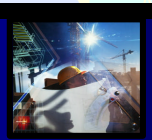
- 1.3.1 Materials ($2,300)
- 1.3.2 Work ($2,000)

Cost of Excavation = $3,700

Work Packages

Total Cost = $18,700

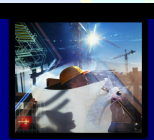
***Must Include All TEC and OPC Work Packages to Establish a Sound Estimate**

Contingency

Contingency Should Ensure Successful Project Completion!

- Contingency Should be Considered a Normal Element of a Project
- Contingency Should be Included, Commensurate with Project Risks and Uncertainty, Primarily to Assure Successful Project Completion
- Management Reserve is Not Calculated Separately, but is Allocated Budget to be Used by a Project for Management Control Purposes

Calculating Contingency

Steps in Calculating Contingency Using A Probabilistic (Monte Carlo) Approach

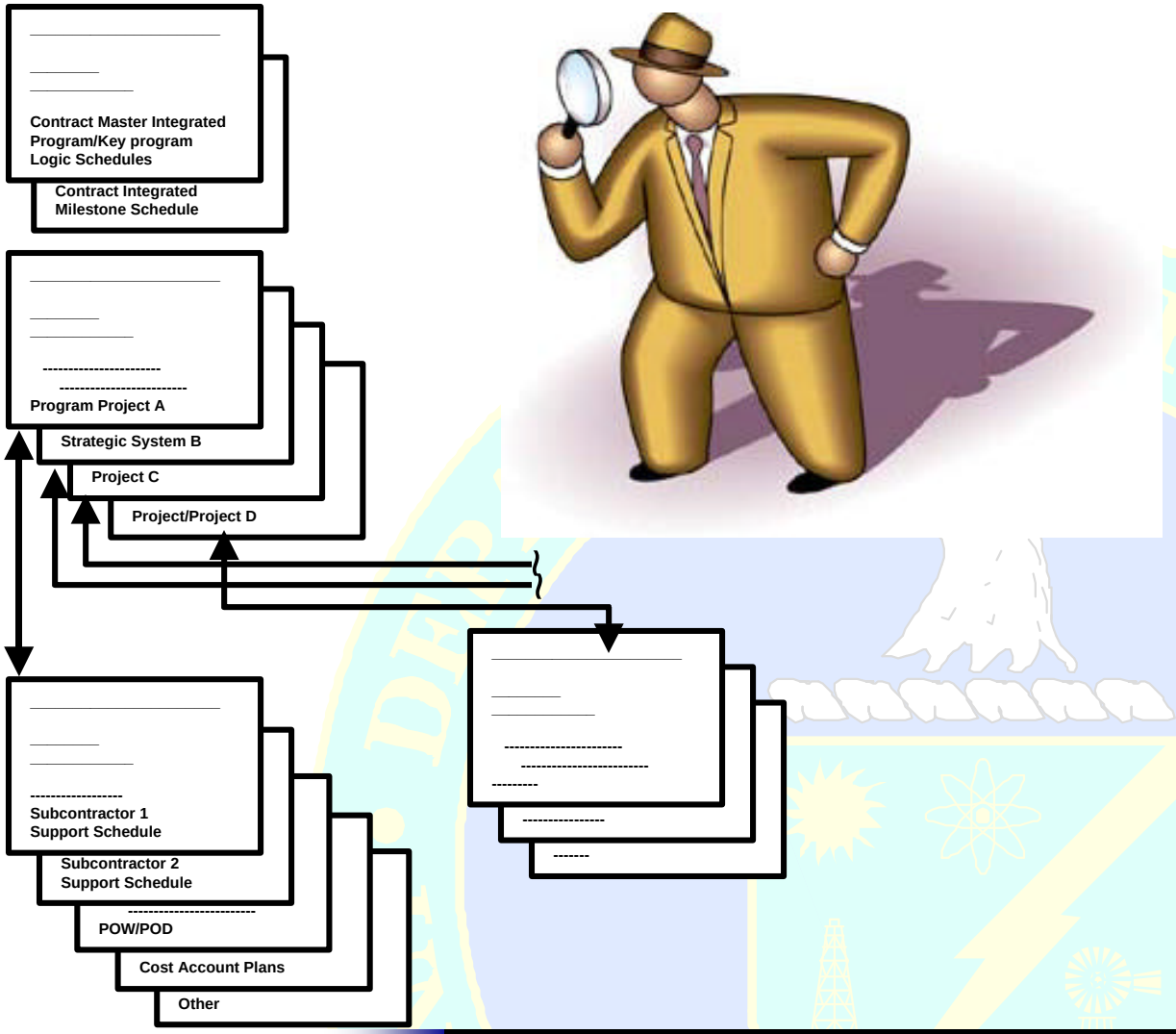
- Step 1. Determine Base Cost Estimate
- Step 2. Determine Risks Associated with Each WBS Element
- Step 3. Determine Best, Expected, and Worst Case Cost Scenarios for Each WBS Element
- Step 4. Run Monte Carlo Simulation
- Step 5. Determine Contingency Based on Confidence Levels Shown in Monte Carlo Simulation

Schedules

Customer/Program/ Contract Master Diagrams (Levels 0, 1)

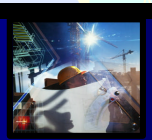
Intermediate Schedules Project Summary and Project Master Schedules (Level 2)

Detail Support Schedules (Level 3)



Resource Planning

- Fundamental Concern
  - How Should We Assign Human and Material Resources to Our Project?
- Things to Consider
  - Technical Requirements of Project
  - Competence of Prospective Workers
  - What Human and Material Resources Are Available
- Work Packages—Integrated into Schedule

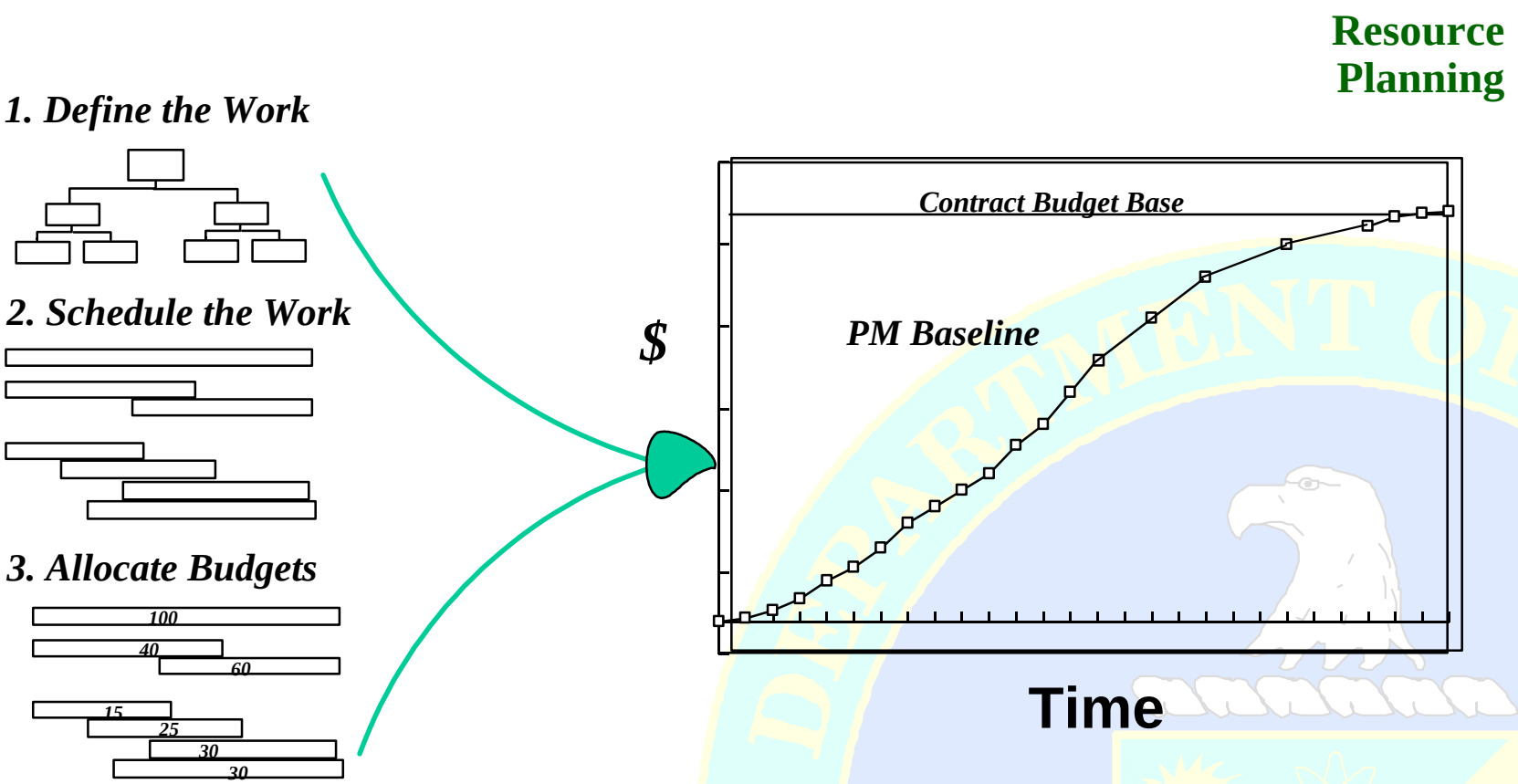
Resource Leveling

Resource Planning

- Work Package Resources Integrated into the Schedule
- Scheduling the Project in Such a Way As to Use Resources Most Effectively
- Scheduling the Project to Minimize Idle Time for Resources
- Adjusting Task Allocations to Eliminate Over Commitment of Resources

Finalizing CD-2 Package Resource-Loaded Schedule

Resource Planning

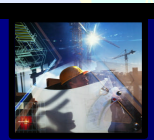


Creating a Resource-loaded Schedule = A Time-Phased Baseline (Performance Measurement Baseline)

Earned Value Management System

DOE has Adopted ANSI/EIA-748-1998, "Earned Value Management System" as the Core Basis/Standard for Program and Project Management System Requirements

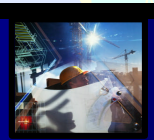
- System Defines 32 Criteria
- Criteria Grouped by:
  - Organization
  - Planning, Scheduling, and Budgeting
  - Accounting Considerations
  - Analysis and Management Reports
  - Revision and Data Management
- Manual Allows Tailoring for Projects Under $20M

Measured Work Performance

Earned Value Management System

- Perhaps the Single Most Important Question in Project Control Is: “How Much of the Work Has Been Done?”
- Unfortunately, Most People Don’t Know How to Answer This Question. Left to Their Own Devices, They Tend to Overstate Progress.
- The Earned Value Approach May Be the Best Approach for Project Staff to Get a Handle on This Matter.

The Rudimentary Building Blocks

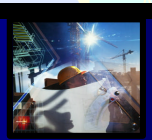
- Budgeted Cost of Work Scheduled (BCWS) = Planned Costs
- Actual Cost of Work Performed (ACWP) = Actual Costs
- Budgeted Cost of Work Performed (BCWP) = Earned Value
  - Interpretation of BCWP: Task A, Which I Was Supposed to Complete Today, is Scheduled to Cost $1,000. I Am Only 85% Done on This Task. Thus, I Have Done $850 Worth of Work– Which is my Earned Value (BCWP).

Calculating Earned Value (BCWP)

The Concepts of BCWS and ACWP Are Straightforward – They Are Planned Costs and Actual Costs, Respectively.

Calculation of Earned Value (BCWP) Is More Complex. It Entails Estimating How Much of a Task Is Complete.

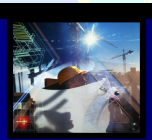
Note that this is Different From Asking: How Much of Our Budget Have We Spent on This Task, or How Much Material Have We Used?

Cost Variance

Cost Variance (CV) = BCWP – ACWP

Interpretation of CV: I Have Completed $850 Worth of Work (BCWP), But it Actually Cost Me $900 to Do This (ACWP). It Had Cost Me $50 More Than I Had Originally Thought (CV) to Do What I Have Done.

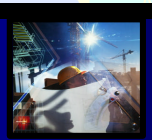



Assessing "Efficiency" of Project Expenditures

Earned Value Management System

Cost Performance Index (CPI) = BCWP/ACWP

Interpretation: The Project Completed $850 Worth of Work (BCWP). It Has Cost Me $900 to Do So (ACWP). Each Dollar the Project Actually Spent Generated 94.4 Cents Worth of Work (Cost Performance Index)

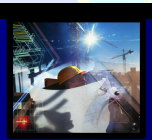



Schedule Variance

Schedule Variance (SV) = BCWP – BCWS

Interpretation of SV: As of Today, the Project Was to Have Finished $1,000 Worth of Work on Task A (BCWS). The Project Actually Completed $850 Worth of Work (BCWP). Thus, I Am Behind Schedule by $150 Worth of Work (SV).

Note: Both Cost and Schedule Variances Are Valued in Dollars!

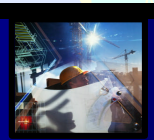



How Much Work Has Been Done?

The Schedule Performance Index (SPI) Assesses How Much Work Has Been Achieved (BCWP) and Contrasts That With What Was Supposed to Be Achieved (BCWS).

SPI = BCWP/BCWS

If the Project Has Accomplished $350,000 Worth of Work (BCWP) but Planned to Have Completed $400,000 Worth of Work (BCWS), …
SPI is 0.875, Indicating that the Project has Achieved 87.5% of What We Were Supposed to Achieve.

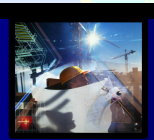



Projecting Future Developments

Earned Value Management System

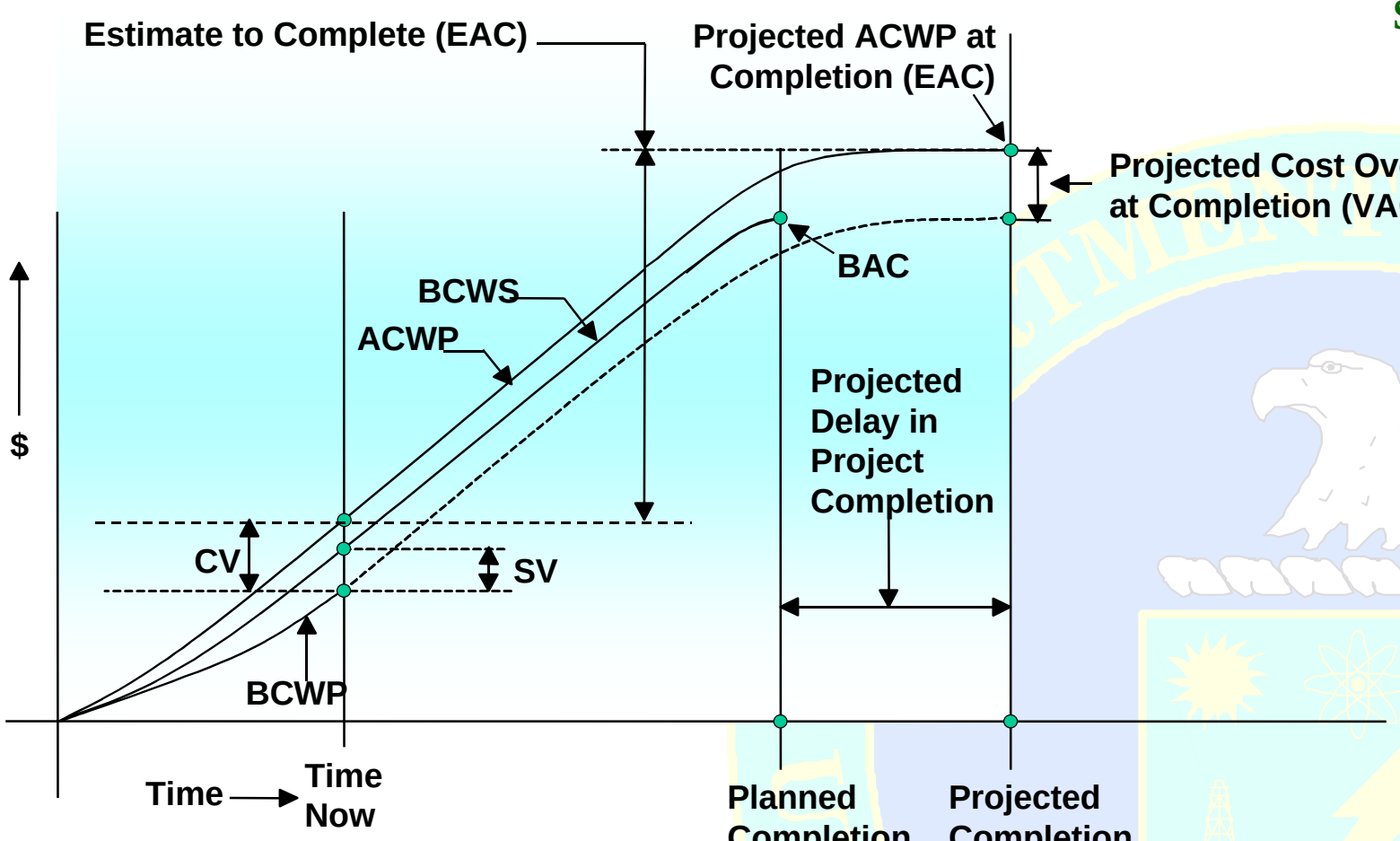
- Budget at Completion (BAC):
  How Much Is This Project Budget to Cost in Total?
- Estimate at Completion (EAC):
  Given What Is Known Today, How Much Will the Project Cost in Total?

  EAC = BAC/CPI
  If BAC = $1,000,000 and CPI 0.9,
  Then EAC = $1,111,111
- Estimate to Complete (ETC):
  Given What Is Known Today, How Much More Will it Cost Us to Complete the Project?
  ETC = EAC – ACWP
  If EAC = $1,111,111
  And ACWP = $8,000,00
  Then ETC = $311,111

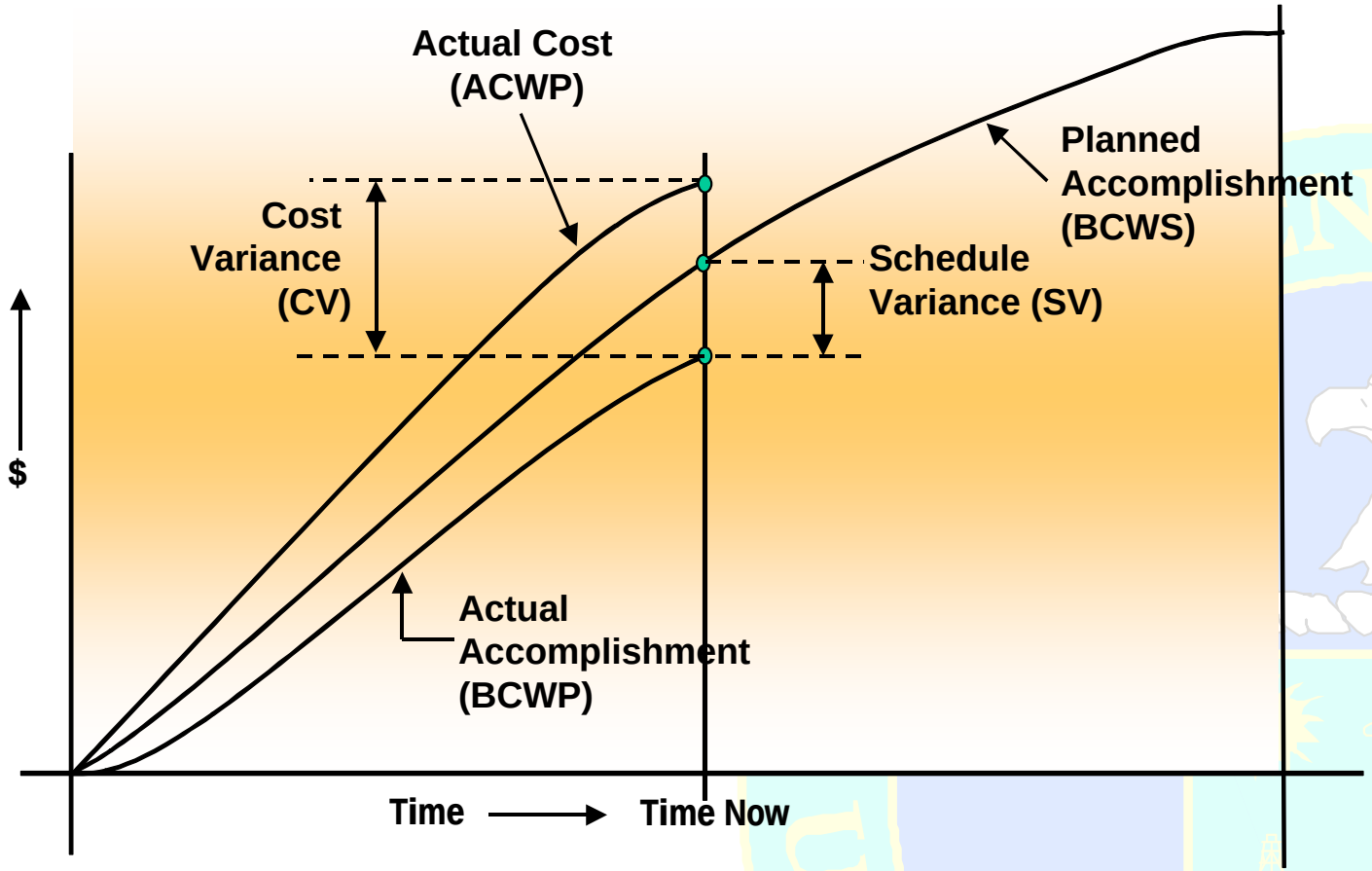
Earned Value System Parameters

Earned Value Management System



Data Needed for Earned Value Determination

Earned Value Management System



Performance Measurement

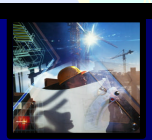
Formalized Methodology for Cost-effective Implementation of Performance Measurement on a Project Should Achieve the Following Objectives:

- Enable the Contractor to Depict the Work Plan for Subsequent Monthly Assessments
- Analyze the Current Performance Status and Forecast Impacts to work scope, schedule, or cost baselines
- Provide Data Needed for Required DOE Reporting and Internal (contractor) Progress Reporting
- Provide Trending and Projecting Data that Provide Early Warning of Potential Project Performance Problem Areas
- Provide Detailed Data to Alert Work Package Managers of the Need for Corrective Measures

Performance Measurement Process

An Effective Performance Measurement Process Exhibits the Following Characteristics:

- The Process is Accepted, Documented (formalized), and Effectively Implemented
- Implementation Adequately Addresses the Need for Measuring and Reporting Project Performance Against Work Scope, Schedule and Cost Baselines
- Implementation is Integrated with and Reflects the Scheduling and Cost System Baselines, Budgeting and Cost Estimating, Separation of Funding Sources, and Types of Funding (capital versus operating)
- Baseline Change Control Systems and Procedures are In Place and Functioning
- The Separation (identities) of Projects, and Individual Work Tasks, Contracts, and Subcontracts are Maintained and Consistent with Organizational and Work Breakdown Structures
- The Process is Effectively Implemented by All Project Participants, as Appropriate
- A Risk-based Tailored Approach is Used in Establishing Performance Measurement and Control Requirements

Performance Analysis and Reporting

Performance Measurement

A Performance and Progress Review and a Project Performance Report are Both Planned, Structured, Periodic, Formalized, and Documented with Four Primary Objectives:

- Determine Current Project/Task Performance Status by Comparing Actual vs. Planned Accomplishments as Represented in the PMB
- Forecast Expected Project/Task Completion Dates and Costs; Analyze the Potential Impacts to Work Scope, Schedule, and Cost Baselines; and Develop and Provide Corrective Action Plans when Needed to Minimize Adverse Impacts to these Baselines
- Identify Specific Project Activities that Need Corrective Measures, and Identify and Implement these Corrective Measures
- Periodically Review Project Performance with Cognizant DOE Personnel, and Document Project Status through Formal Progress Reports

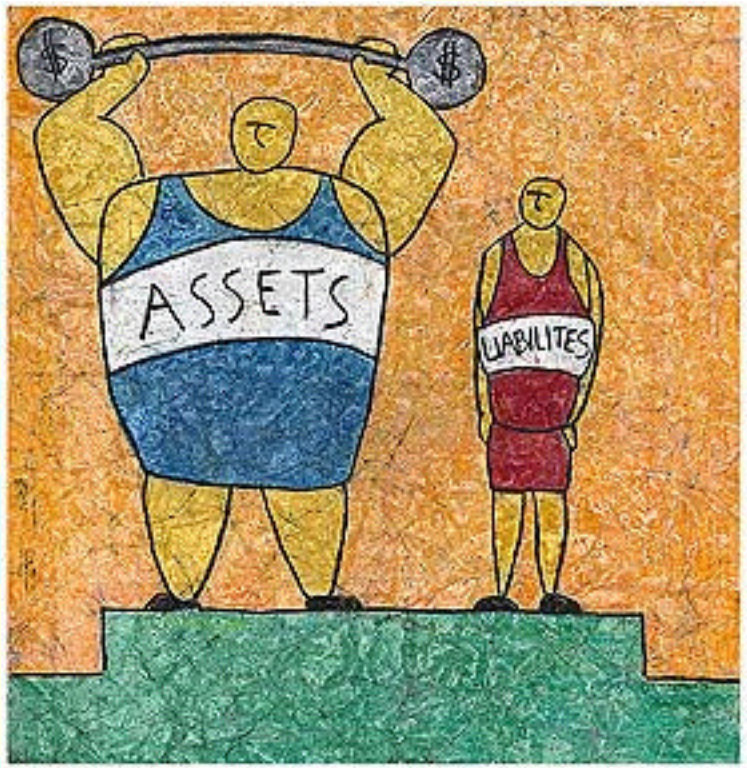



Assessments

Performance Measurement

Assessments Accurately Determine the Health and Status of the Project

- Assessment Areas
  - Performance Characteristics
  - Test and Evaluation
  - Logistics Requirements and Readiness Objectives
  - Cost Performance
  - Funding
  - Schedule Performance
  - Contracts
  - Production
  - Management Structure
  - Project Risks

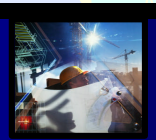


Control

Execution Phase

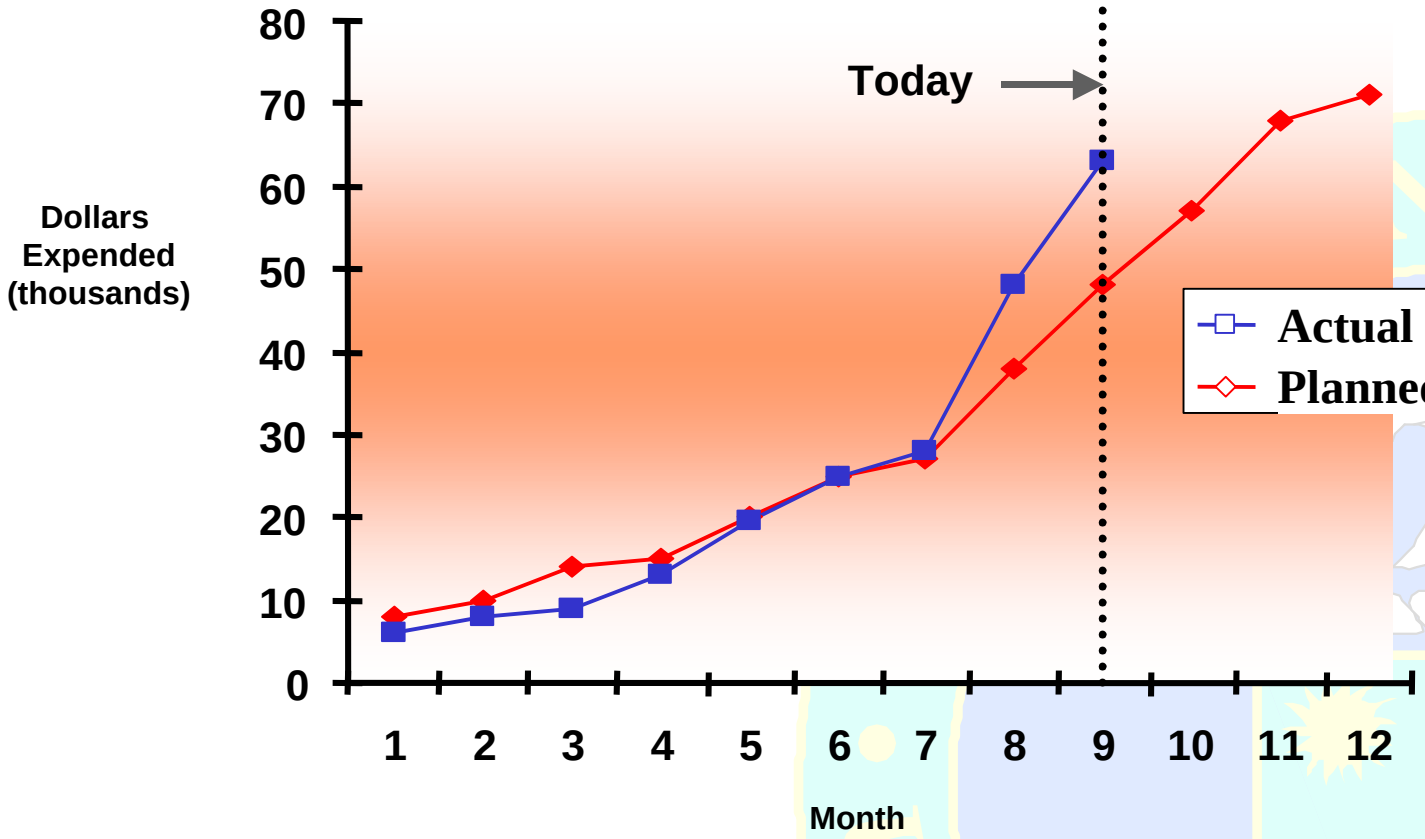
When Control Leads to Action

- Control Entails More than Merely Identifying Variances. Once Variances are Observed, Decisions Need to be Made to Determine Whether they Reflect a Situation that Demands Action in Order to Get the Project Back on Track (e.g., Schedule Slippage Might be Handled by Adding More Resources to the Project)
- When Engaging in Action to Get a Project Under Control, Great Care Must be Taken to Assure that the Action Does not Lead to Unintended Consequences. When the Cure is More Dangerous than the Disease, it Should Not be Employed

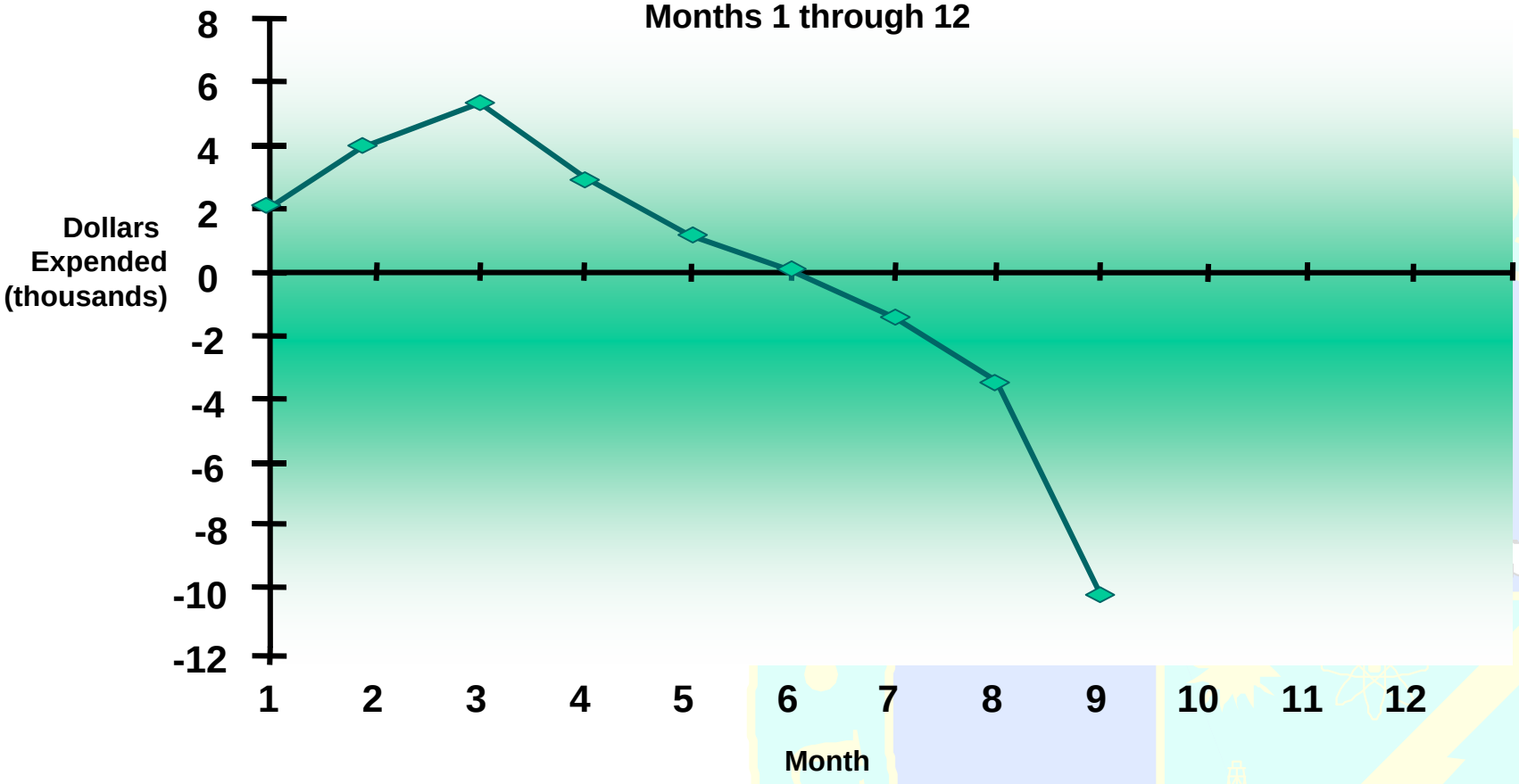
Tracking Cumulative Project Expenditure (S-Curve)

Control



Tracking Cumulative Project Variance

Control



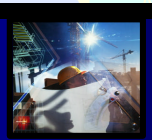
Examining Variances

Variance = Plan – Actual

Don't ask: Do We Have a Variance this Month?
The answer is YES

Ask: Does the Variance We Have this Month Lie within an Acceptable Range?

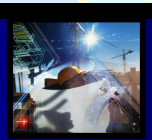
Management (by Exception):
Focus is on Activities Whose Variance Lies *Outside* the Acceptable Range

Monitoring Progress

For Effective Scheduling and Cost Control, Progress Measurement Should Start at the Beginning of the Project and Finish Only Upon Project End

	Project Monitoring and Control	Progress Reporting
Purpose	Identify and correct problems	Present project situation
Focus	Individual tasks, resources	Major elements, critical items
Time Scale	Hourly, daily	Weekly, monthly
Level of aggregation	Task, individual resource	Task groups, major milestones, cost centers
Point of view	WBS, organizational breakdown structure (OBS)	WBS, OBS, system, subsystem, function, phase, contractor, manager and so on

Maintain Control

Ongoing:

Completely and Objectively Monitor Activities in Progress

Measure Progress and Cost

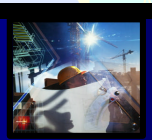
Re-estimate Costs

Re-plan, Reforecast and Reprogram

Completely and Objectively Monitor Activities in Progress

Identify and Fairly Evaluate Corrective Actions to Restore Progress

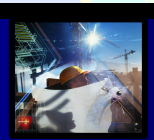
Select, Implement and Monitor the Most Effective Actions

Exercise

Analyze Project Earned Value Report

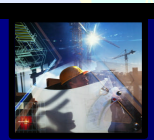
- Recommend Corrective Actions

Maintain Control (cont.)

Scheduling and Cost Control Includes Reviewing the Following Against the Data Date:

- Resource Availability
- Activity Estimates
  (Time, Effort, Cost, Deliverables)
- Network Logic
- Constraints and Delivery Times

Change Management

Project Change Occurs for Many Reasons, Including:

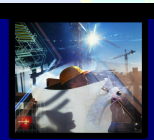
- Customers
- Project Team Members
- Budgetary Instability
- Technology
- Environment
- Government

Change Management (cont.)

In Its Simplest Form, Getting Back on Schedule Involves Re-allocating Resources from Non-critical Path Activities to Critical Path Activities. (This Process is Also Known as Float Management.)

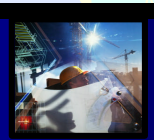
The Change Management Process is Simple. It Should Flow as Follows:

- Identify and Submit Change Request
- Screen Change Request
- Assess Impact of Change
- Obtain Customer Approval
- Implement Change, Including Adjustments to the Schedule

Preparing for Critical Decision-2

- Risk Management Plan
- Preliminary Design Review
- Project Execution Plan

Risk Management Plan

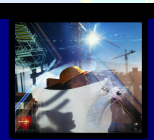
Preparing for CD-2

- Update the Risk Assessment
- Include all Mitigation Actions in the Estimate
- Utilize Risk Assessment in Developing Contingencies

Conduct Preliminary Design Review

Preparing for CD-2

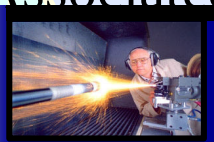
- Evaluate Adequacy of Drawings and Specifications
- Assess if Design Deliverables are Consistent with Functions and Requirements
- Assess Whether Design for Safety and Mitigation of Hazards are in the Baseline
- Assess Whether Functional and Requirements are Reflected in the Baseline
- Evaluate Alignment between System Requirements and Mission Need
- Assess the Applicability of Value Management/ Engineering and Incorporation of Value Engineering Analysis in the Baseline

Project Execution Plan

Preparing for CD-2

- Prepared by the IPT under Leadership of the Project Director
  - Summarizes Critical Information Necessary to Manage a Project
  - Utilizes all Project Planning Processes
  - Is Thorough and Comprehensive
  - Uses an Integrated, Systematic Approach
  - Updates Draft Submittal for Critical Decision-1
- The Plan Should:
  - Accurately Reflect the Manner in which the Project will be Managed and Performed
  - Receive the Necessary Local Reviews and Approvals
  - Be Submitted to the Appropriate Acquisition Executive in a Timely Manner, Prior to the Associated Critical Decision

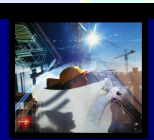



Components of the Project Execution Plan

Preparing for CD-2

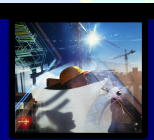
The PEP Guides Project Execution and Facilitates Communication Among Stakeholders. PEPs Should Balance Lowest Project Cost, Shortest Time, & Least Risk

- MNS/Project Objectives
- Summation of PB and KPPs
- Project Description (Operational, technical, & functional reqm’ts)
- AS (funding, site development, permit, licensing)
- Project Organizational Structure
- Resource Requirements
- Long-lead Procurement Action
- Integrated Safety Management
- Systems/Value Management Planning
- Risk Management Plan
- Quality Assurance Plan
- R&D, T&E, Alternative Studies, Trade Studies
- Design Reviews
- WBS and WBS Dictionary
- Cost, Schedule, & Scope Order of Range Estimates
- Life Cycle Costs, Cost Control, Change Management
- Project Control Systems and Reporting Systems
- Inspection, Testing, Test Evaluation, Turnover, and Startup
- Training

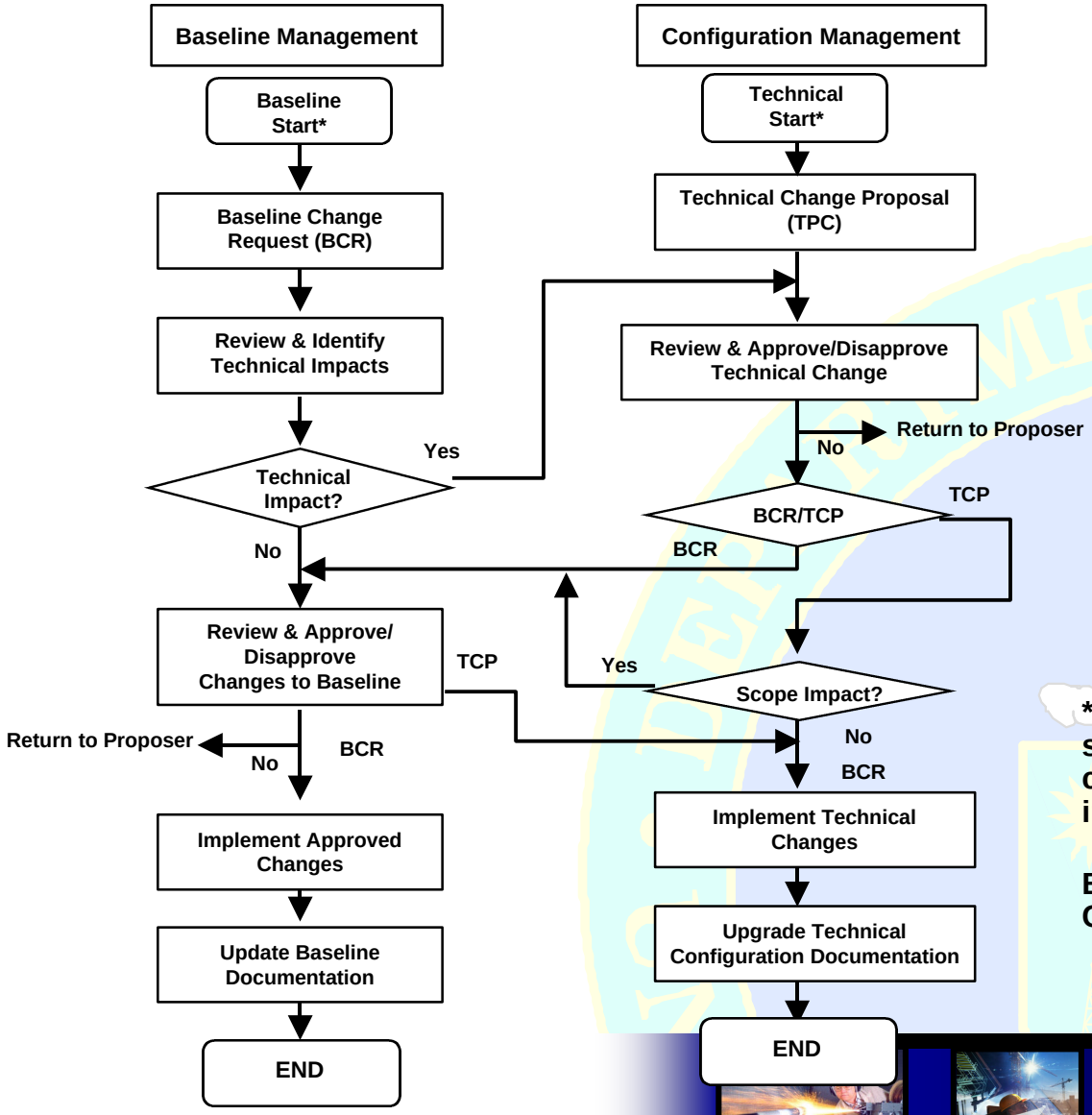
Change Control

- Change Control Process
  - Anticipate, Recognize, and Predict Changes
  - Prevent Performance Baseline Deviations
  - Evaluate and Understand the Impacts of Each Change
  - Identify, Understand, and Control the Consequences of Changes
  - Prevent Unauthorized or Unintended Deviations from Approved Baselines
  - Ensure Each Change is Evaluated, Reviewed, and Dispositioned at the Proper Management Level
- Change Control Board
  - Each Organization Level Should Establish a Change Control Board
  - Document the Board, Thresholds, and Change Control Process in the Project Execution Plan

Overview of Change Control

Change Control



***Baseline includes scope, schedule, and cost; technical is included in scope**

BCR – Baseline Change Request

Change Control Authorities

Change Control

Sample Change Control Authority Matrix

Approval Authority

Level-1 Changes – Under Secretary or NNSA Administrator
Level-2 Changes – PSO/Deputy Administrator
Level-3 Changes – Project Manager as delegated

Major and Non-Major System Projects:

	Level-1	Level-2	Level-3
Technical	Changes to technical requirements and parameters that do not meet mission need objectives	Changes to technical requirements and parameters that affect safety basis, operation functions but do not affect mission need	As defined in the Project Execution Plan (PEP)
Schedule	6 or more months increase (cumulative) in a project-level schedule milestone date, not exceeding the PB threshold	3 to 6 months increase (cumulative) in a project-level schedule milestone date	As defined in the PEP
Cost	Increase over $50M and/or Increase in TEC requiring Congressional reporting and not exceeding the PB TPC	Increase over $25M	As defined in the PEP

Change Control Steps

Discretionary Changes

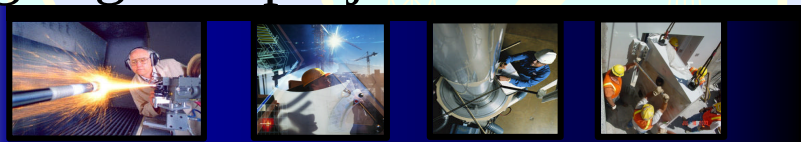
- Step 1. Identify or propose a necessary change to correct project planning deviations
- Step 2. Require that the proposed change be a written submittal
- Step 3. Evaluate the change with respect to project impacts, particularly scope, schedule and cost
- Step 4. Approve/Reject the change at the appropriate control level
- Step 5. Incorporate approved changes into project planning documentation and contracts
- Step 6. Evaluate the change by assessing actual project impacts resulting from the change against projected impacts.




Change Control Steps (cont.)

Directed Changes

- Step 1. Recognize the change as a directed action by the proper authority
- Step 2. Require that the proposed change be a written submittal
- Step 3. Quantify the impending baseline impacts of the change
- Step 4. Accept the change at the implementing level with notification of the proper organizational elements that a change has occurred on the project or is imminent
- Step 5. Accommodate the change by making the physical corrections and updating project documentation
- Step 6. Evaluate the change by assessing actual project impacts resulting from the change against projected impacts



If The Commitment Cannot Be Honored…

Change Control

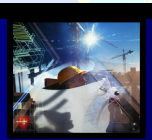
- Must Report the Breach (or potential breach) to the Department Senior Acquisition Executive (Deputy Secretary)
- Must Re-evaluate Project
  - Rebaseline
  - Cancel

Approve Performance Baseline CD-2

Required Documents

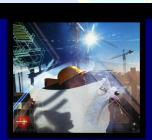
- Detailed Resource-Loaded Schedule
- Detailed Cost Estimate
- System Functions and Requirements Document (also referred to as the “Design-to” requirements or Design Criteria)
- Results of and Responses to Site Preliminary Design Review
- Project Execution Plan
- Hazards Analysis
- Risk Management Assessment
- Acquisition Strategy

An External Independent Review will be Performed by OECM to Determine Readiness

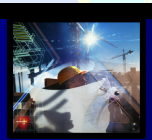



Definition Summary

- TBD

Execution Phase—
Complete Design

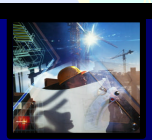
Execution Objectives

- Develop preliminary designs, further defining selected alternative
- Develop Performance Baseline to prepare and submit project budget requests and capital asset plans to Congress and OMB
- Present Performance Baseline to SAE or designated AE for approval
- Critical Decision-2 - Approve Performance Baseline
- Develop final design (final drawings, technical specifications, and require contract documents)
- Develop schedule of project activities and their relationships to each other
- Perform Earned Value Mgmt., coordinating work scope, schedule, and cost goals
- Perform configuration management
- Critical Decision-3 - Approve Start of Construction
- Clearly identify contract, procurement, and construction contractor requirements
- Effectively manage and control technical, scope, schedule, cost baselines, and risk allocations
- Change control
- Oversee and manage subcontractors and vendors
- Plan commissioning and acceptance activities

Approve Start of Construction Critical Decision-3

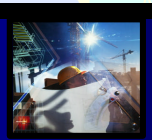
Documents / Actions Required

- Finalize Design Drawings and Specifications
  - Conduct Final Design Review
- Update Project Execution Plan
- Develop Construction Planning Document
- Develop Detailed Resource-Loaded Schedule
- Develop a Detailed Cost Estimate
- Update System Functions and Requirements Document Reflecting Changes (change control)
- Update the Risk Management Assessment
- Develop Safety Documentation
- Update the Acquisition Strategy
- Assess the IPT for Appropriateness of Staffing Levels and Functional Support

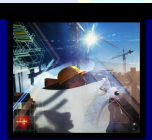
Execution Phase—Construction

- Execution or Implementation
- Contracting
- Documentation
- Testing and Commissioning
- Demobilization and Closeout
- Approve Start of Operations or Project Closeout (CD-4)
- Post-Activities

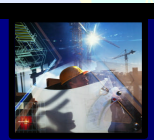
Execution or Implementation

- Actions Required
  - Establish Contract
  - Update Integrated Project Team
  - Establish Monitoring Tools/Earned Value System
  - Implement Commissioning Plan
- During this Stage of the Project, the Critical Success Factors Include
  - Clearly Identified Contract, Procurement, and Construction Contractor Requirements
  - Effective Management and Control of Technical, Scope, Schedule, Cost Baselines, and Risk Allocations
  - Efficient and Effective Change Control
  - Oversight and Management of Subcontractors and Vendors
  - Well-planned Commissioning and Acceptance Activities

Contracting

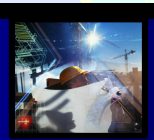
- The Contractual Mechanism for the Acquisition May be via Existing Contracts (work authorizations and allotments) or New Contracts
- The Contract Establishes the Scope and Budget for the Negotiated Cost of the Project (contract)
- The Contract Cost will Usually be Negotiated at a Price Less than the Total Project Cost

Exercise

Develop a List of “Contracting Provisions” to Cover in the Statement of Work for:

- Fixed Price Contract
- Performance Contract
- Cost Plus Award Fee Contract

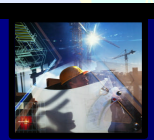
Documentation

Importance of Documentation

- Documentation Meets a Good Deal of Resistance from Project Staff, Who Often See it as Non-creative and Excessively Bureaucratic
- Good Documentation is Often a Crucial Component of Project Success
- Documentation is Needed for Project Control, Evaluation, Debugging, and Coordination of Project Effort Among Team Members
- Documentation is Vital for System Maintenance
- Documentation is Mandatory for a Readiness Assessment or Operations Readiness Review

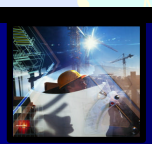
Testing and Commissioning

- *Execution Phase* - Deliverables that Operate as Intended
- *Testing and Commissioning* - Formal, Documented Process that Includes a Transition to Operations Achieved By:
  - Early Project Planning, Organizing and Preparation for Transition
  - Systematically Performing Required Inspections and Testing
  - Providing Adequate Documentation of Testing and Transition Activities

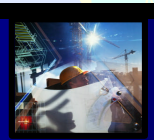
Execution Summary

- TBD

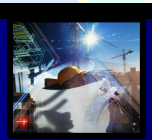
Transition/Closeout

- IPT
- Readiness Assessment
- Operations Readiness Review
- Startup
- Testing
- Checkout
- Lessons Learned
- Project Closeout Report
- CD-4

Transition / Closeout Objectives

- Perform equipment, systems and facility checkout and walk-down
- Transfer knowledge through training and other methods
- Turnover project documentation records
- Prepare and distribute lessons learned document
- Prepare facility, equipment, system and documents for Operation Readiness Review
- Critical Decision-4, Start of Operations or Project Closeout
- Bring project to planned, orderly conclusion
- Ensure smooth demobilization process
- Perform administrative and financial closeout after project completion
- Final closeout

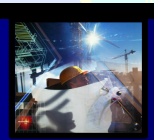
Checkout

Walkdowns with Combined Project and Operations Teams:

- Identify Deficiencies
- Develop Findings Punch List
- Identify Corrective Actions

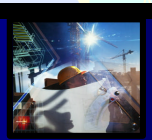
Construction Acceptance Testing

- Designed to Test and Document that Physical Installations are in Accordance with Engineering and Design Documents
- Performed Prior to Turnover and Functional Testing
- Generally a Component and Not a System
- Generally the Responsibility of the Construction Contractor
- Tests are Witnessed and Verified
- Performed in Accordance to Testing Procedures

Functional Systems

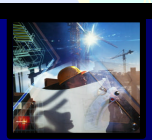
- Based on Detailed Design and Design Basis Documentation
- Coincides with Work Breakdown Structure
- Consists of a Group of Components that, Taken Together, Form a Logical System
- Meaningful Testing Can be Performed

Functional Performance / Operational Testing

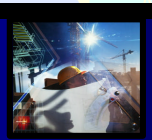
Testing and Commissioning

- Verifies that Structures, Systems and Components (SSC) Meet Design Requirements *(acceptance test)*
- Verifies Correct SSC Operation *(operational tests)*
- Trains User Personnel

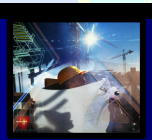
Test Procedures

- Identify Test Requirements and Acceptance
- Develop Test Programs and Procedure Requirements
- Tests Can be Controlled, Planned, Performed, and Documented
- The Project Organization Provides Test Requirements and Acceptance Criteria
- Test Procedures are Reviewed and Approved in Accordance with Applicable Requirements, Generally by Both the Project and the User Organization

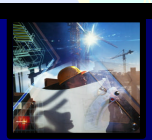
Test Procedures (cont.)

- Acceptance Testing is Witnessed and/or Inspected by Personnel Who are Independent of the Organization Performing the Work
- Test Results are Documented
- Test Results are Evaluated for Acceptability by the Project and/or the User Organization
- Discrepancies or Failures are Documented, Reviewed, Corrective Actions Identified, and the Test (or a portion of the test) Repeated

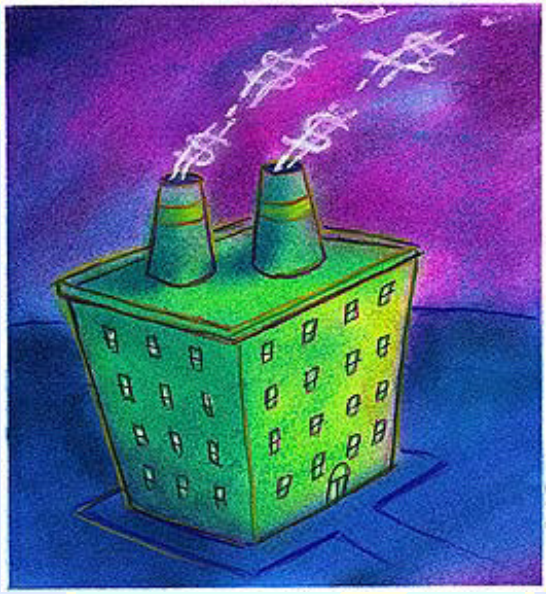
Logic for Testing Sequences

- Developing the Project's Testing and Startup Plan Should Begin Early in the Project's Life Cycle.
- Testing and Startup Activities Must be Integrated with a Number of Other Project Activities, Including:
  - Project Schedule Preparation
  - Project Funding Requests
  - Design Document Completion
  - Procurement and Construction Package Completion

Logic for Testing Sequences (cont.)

- Procurement and Construction Contract Awards and Completion Schedules
- Test Procedure Preparation, Approval and Performance
- Test Team Formation and Training
- Support Infrastructure and Utility Availability
- Test Equipment Identification and Procurement
- Testing Materials and Supplies
- Disposal of Testing Wastes, e.g., Water
- User Support

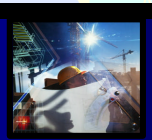


Startup Testing Activities / Logic

- Integrate Construction and Startup Schedule
- Make Jurisdictional Transfer From Construction to Testing when Functional System is Complete
- Develop a Distinct Boundary Between Test Activities and Construction Activities
- Maintain Close Interface Between Construction and Startup

Exercise

- Develop List of Potential Tests to be Performed that Ensure KPPs have been Met for Sample Project

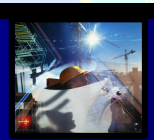
Readiness Assessment

- A Readiness Assessment (RA) is a Review Conducted to Determine a Facility's Readiness to Startup or Restart when an Operational Readiness Review is Not Required, or When a Contractor's Standard Procedures for Startup are Not Judged by the Contractor or DOE Management to Provide an Adequate Verification of Readiness
- For Restarts of Nuclear Facilities Not Requiring an Operational Readiness Review, Management Evaluates and Ensures that Contractor Management Performs an RA Prior to Restart
- When an RA is Required, Field/Operations Offices Develop Procedures and Ensure that Contractors Use the Procedures to Gain Operations Office Approval of the Startup or Restart of Nuclear Facilities

Operation Readiness Review

DOE Order 425.1—Tailored to the Project Minimum Core Requirements

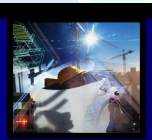
- Correct Procedures and Safety Limits
- Training and Qualification Programs for Operations and Operations Support Personnel have Been Established, Documented, and Implemented
- Level of Knowledge of Operations and Operations Support Personnel is Adequate
- Facility Safety Documentation is in Place that Describes the “Safety Envelope” of the Facility

Operational Readiness Review (cont.)

Testing and Commissioning

- A Program is in Place to Confirm and Periodically Reconfirm the Condition and Operability of Safety Systems
- A Process has Been Established to Identify, Evaluate, and Resolve Deficiencies and Recommendations
- Formal Agreements Establishing Requirements are In Place Between the Operating Contractor and DOE
- Management Programs are Established, Sufficient Numbers of Qualified Personnel are Provided, and Adequate Facilities and Equipment Are Available to Ensure Operational Support Services

Approve Start of Operation or Project Closeout

Testing and Commissioning

Prerequisites for Critical Decision-4

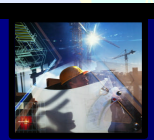
- Verify Performance Criteria have Been Met
- Issue a Final Safety Analysis Report or Appropriate Safety Documentation
- Prepare Operating and Maintenance Procedures
- Complete Acceptance Testing and Correct Deficiencies
- Complete a Readiness Assessment or Operational Readiness Review
- Provide a Trained and Qualified Operations and Maintenance Staff
- Complete and Issue a Project Transition-to-Operations Report
- If Necessary, Prepare and Issue a Project Closeout Plan that Includes Management Agreement for Final Fiscal Cost and Administration Closure




Demobilization and Closeout

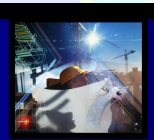
A Project Director Should Consider the Following:

- A Closeout Plan Including an Evaluation of Existing Resource Requirements
- Meeting With the Project Team to Provide Information, Finalize Remaining Tasks and Provide Support to Remaining Team Members
- Determine Assignments to Complete Final Project Documentation Such as a Summary Status Report, Budget Report, Final Costs Report, and Executive Summary
- Provide Information Presentations for the Department Staff, the Operational Organization, Stakeholders and Media

Demobilization and Closeout (cont.)

- Work with Functional Peers and Team Members to Establish Clear Phase-out Procedures in Terms of Each Individual's Responsibilities, Availability, and Future Assignments
- Meet with Human Resources, Functional Managers, and Line Managers to Identify Personnel Needs; Assist Team Members in Scheduling Interviews; and Participate in Matching Needs, Capabilities, and Availability
- Acknowledge and Recognize the Contributions of All Project Participants

Approve Start of Operations or Project Closeout (CD-4)

Prerequisites for Critical Decision-4

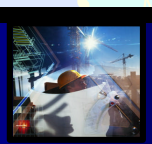
- Verify Performance Criteria have been Met
- Issue a Final Safety Analysis Report or Appropriate Safety Documentation
- Prepare Operating and Maintenance Procedures
- Complete Acceptance Testing and Correct Deficiencies
- Complete a Readiness Assessment or Operational Readiness Review
- Provide a Trained and Qualified Operations and Maintenance Staff
- Complete and Issue a Project Transition-to-Operations Report
- If Necessary, Prepare and Issue a Project Closeout Plan that Includes Management Agreement for Final Fiscal Cost and Administrative Closure

Post-Activities

- Post-Activities for Critical Decision-4
- Demobilize the Project
- Approve and Complete a Migration to Production for Software
- Complete Operational Documentation
- Complete As-Builts
- Prepare and Issue a Lessons Learned Report
- Prepare and Issue a Project Completion Report

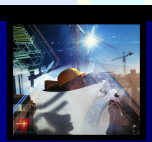
Transition / Closeout Summary

- TBD

Review Questions

1. TBD
2. TBD
3. TBD
4. TBD

Refresher Training Summary

- TBD